4 Environmental Consequences

4.1 Land Use and Aesthetics

The proposed disposal action would result in the disposal of 8,435 acres of the NAPR property from federal to private ownership. The remaining 230 acres would remain in federal ownership. However, operational responsibility of these parcels would transfer from the Navy to other federal entities. It is assumed that the portion of NAPR disposed of to private ownership would be redeveloped as provided for in the Reuse Plan prepared by the LRA. As required by NEPA, a federal agency proposing an action must evaluate the environmental effects (impacts) that could reasonably be anticipated to be caused by or result from the proposed action. This section describes the potential environmental consequences associated with disposal and reuse of NAPR property transferred to non-federal entities.

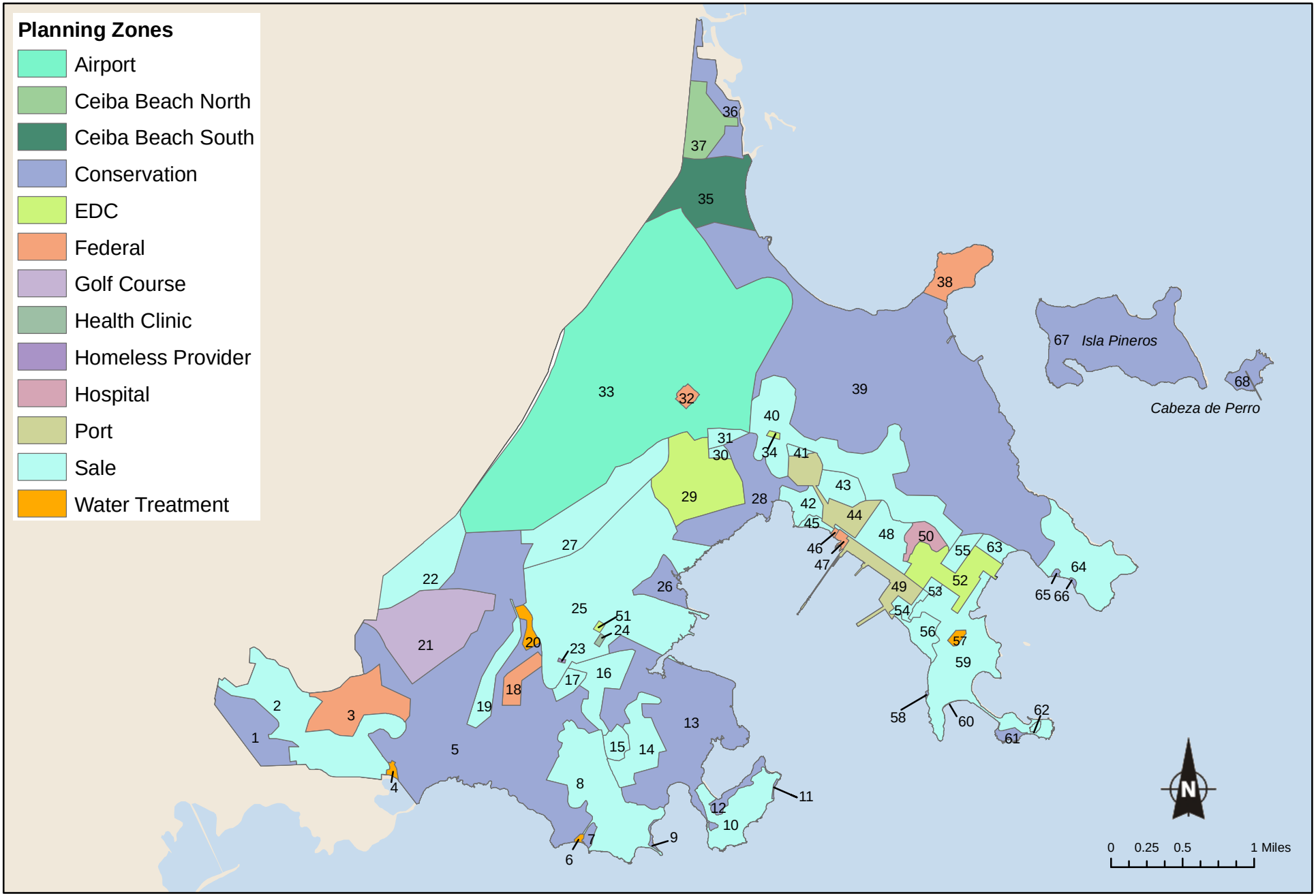
As discussed in Section 1.6, the impacts associated with reuse of the property through 2013 (i.e., Phases I and II) under the Reuse Plan are considered indirect impacts of the proposed action. These impacts are described at a general level of detail, consistent with the level of detail found in the Reuse Plan. However, the magnitude of redevelopment beyond Phase II (i.e., Phases III and IV full build-out to 2037) would be a function of economic factors and other factors that, with the exception of certain Navy-imposed restrictions, would be beyond the control of the Navy. As such, the ultimate redevelopment of the property through Phase IV of the Reuse Plan is considered to be speculative at present; therefore, the proposed reuses defined in Phases III and IV of the Reuse Plan have been evaluated as unforeseeable, long-range implications of the proposed action and are evaluated as cumulative impacts in Section 5 of this EA.

In addition, those properties that will be transferred from the Navy's operational responsibility to other federal agencies are excluded from further impact analysis because these properties will remain under federal laws and regulations. These properties are discussed within the context of cumulative impacts.

4.1.1 Land Use

The disposal of NAPR would result in long-term changes to development controls, property ownership, and site access. Navy disposal of NAPR would result in 230 acres of property being managed by other federal agencies and 8,435 acres placed in the ownership of public (Commonwealth) and private sector entities. For the purposes of disposal, Navy subdivided NAPR into 68 distinct parcels (Figure 4-1). The boundaries of these parcels were specifically selected so that sites with remaining environmental contamination would be managed under a single disposal action to facilitate cleanup. Navy would no longer manage or control activities that would occur on the land and the public would have unrestricted access to the property via the existing transportation system.

In a letter dated December 2, 2005 (Appendix A), the Department of Economic Development and Commerce (DEDC) indicated that the department, through the LRA is working on a Special Zoning Plan for Portal del Futuro (the NAPR property), which the LRA will present to the PRPB for approval (this will also require approval of a Strategic Environmental Impact Statement by the Puerto Rico EQB). It is anticipated that the PRPB would adopt the proposed Special Zoning Plan. Upon its adoption, this plan would serve as the official zoning of the property. Any future development projects proposed on former NAPR property would be reviewed by the PRPB to ensure that such development is consistent with the Special Zoning Plan. Under this plan, in the near-term, through Phase II, NAPR would be developed in a manner similar to the historic condition. Thus, the nature of the zoning regulations and classifications that would be adopted and enforced by the PRPB is an important factor in encouraging beneficial land uses and limiting potential internal land use inconsistencies associated with reuse of the property.



Source: Geo-Marine, 2005; ESRI, 2004

Figure 4-1
Parcel Index Map
Naval Activity Puerto Rico

Direct impacts related to implementing the Reuse Plan through Phase II were evaluated based on whether:

- Reuse would be compatible with historical land uses on NAPR;
- Reuse would be compatible with land uses adjacent to NAPR; and
- Reuse would significantly alter the aesthetic quality of the NAPR property.

Internal Land Use Consistency

Table 4-1 provides a summary of the internal land use consistency assessment completed for the preferred alternative.

Table 4-1 Proposed Land Uses through Phase II of the Reuse Plan

Zone	Historical Land Use	Proposed Phase II Land Use	Increase in Developed Area (%)	Internal Land Use Consistency
Zone 1	Airfield; Open Space	Airport; Industrial; Open Space	9%	Compatible
Zone 2	Residential; Open Space	Residential; Institutional; Open Space	24%	Potentially Incompatible
Zone 3	Golf Course; Open Space	Golf Course; Open Space	111%	Compatible
Zone 4	Mixed-Use Commercial; Institutional; Residential; Open Space	Mixed-Use Commercial; Institutional; Open Space	17%	Potentially Incompatible
Zone 5	Residential; Institutional; Open Space	Residential; Open Space	16%	Compatible
Zone 6	Industrial; Institutional; Open Space	Industrial; Transportation; Open Space	17%	Compatible
Zone 7	Institutional; Residential; Industrial; Open Space	Research and Development; Conference Center; Open Space	5%	Compatible
Zone 8	Agricultural; Recreational; Open Space	Agricultural; Recreational; Open Space	0%	Compatible
Zone 9	Open Space	Conservation	0%	Compatible

As shown, proposed land uses in Zones 1, 3, and 5 through 9 were determined to be compatible with historical land uses. Some potential internal land use inconsistencies were identified for proposed development in Zones 2 and 4. The following is a brief discussion of the internal land use assessment within the development zones on NAPR.

- **Zone 1**
  The existing airfield in this zone is proposed for use as an operating cargo and passenger airport. It is expected that the existing airfield would be transferred to the PRPA, which would allow for a self-sufficient airport operation. The PRPA is currently drafting a master plan for the airfield facility. Transfer of the airfield to the PRPA for use as a cargo and passenger airport would be consistent with the historical land use in Zone 1.

  A 75-acre industrial complex is also planned in a currently undeveloped portion of the property. The industrial development would likely be located in the high noise zones associated with operation of the airport; however, this type of development is generally considered compatible with high noise zones around airfields (U.S. Navy 1998).

  A large open space reserve is proposed north of the airport in an area comprising natural vegetation communities. Protection of the natural resources in this area is considered a positive direct land-use impact of the preferred alternative.

  The DHS would obtain control of approximately 10 acres in this zone, including a hangar and aircraft-parking apron to accommodate their direct access to the site. Continued use of the airfield for aircraft operations would be consistent with the planned DHS use of the property. As such, no adverse impacts related to internal land use inconsistencies are anticipated.

- **Zone 2**
  Approximately 300 dwelling units and moderate lodging facilities with approximately 400 rooms are proposed in this zone, as well as a 70,000 to 120,000 square foot learning/government training center. This proposed development would occupy areas that are currently developed primarily for multi-family residences and approximately 80 acres of adjacent undeveloped land. With the exception of an approximately 125-acre parcel where control would be transferred to the U.S. Army for the development of training and administrative support facilities, lands adjacent to this zone are planned to remain undeveloped due to various development constraints (i.e., slopes, wetlands). Consequently, the proposed land uses in Zone 2 would be compatible with the surrounding land use.

  New residential and lodging facilities are planned for an area within Zone 2 that is within the 60 to 65 dB and 65 to 70 dB noise zones associated with former military airfield operations (Reuse Plan; U.S. Navy March 2003). This

area is affected by aircraft noise because of its location downwind of the main airfield runway and because of the absence of topographical barriers, present on other portions of NAPR, that reduce noise levels. Of the existing residential areas on the property, this area in Zone 2 has been identified as the location most affected by aircraft noise (Reuse Plan). Future noise levels experienced by residents or transient visitors within this zone would ultimately depend on the type and number of aircraft using the airport. Based on the potential for high noise levels to affect this portion of the property, the proposed land uses may be incompatible with the planned use of the airfield as a passenger and cargo airport. Further discussion of potential noise impacts related to airport operations is provided in Section 4.7.

- **Zone 3**
  An 88-acre expansion of the existing golf course is proposed within Zone 3, which would be compatible with the existing use of the property as well as the surrounding internal land uses.

- **Zone 4**
  Most of the proposed development within this zone would occupy existing facilities or occur in currently developed areas. For example, the existing elementary school would be reused, as would 150 recently constructed dwelling units. Mixed-use development comprising commercial, retail, and community development is also planned in the existing downtown area of the property. Each of these uses would be compatible with existing and planned internal land uses.

  A University Research Center is also planned in the northern portion of Zone 4 immediately adjacent to the airfield. Classrooms, labs, and dormitories would be occupied initially during Phase II of the Reuse Plan. This use would involve various buildings and other infrastructure that had previously been used to support the airfield operations. Due to its location immediately adjacent to the airfield, the university would be subject to potentially significant aircraft noise. This area was in the 70 to 75 dB noise zone when the airfield was formerly used to support military training (Reuse Plan; U.S. Navy March 2003). Future noise levels encompassing the planned institutional development would ultimately depend on the type and number of aircraft that would be using the airport. Based on the potential for high noise levels to affect this portion of Zone 4, the proposed University Research Center may be incompatible with the planned use of the airfield as a passenger and cargo airport. Further discussion of potential noise impacts related to airport operations is provided in Section 4.7.

- **Zone 5**
  Planned land use in this zone includes redeveloping existing residential areas and constructing new residences on approximately 59 acres of undeveloped land. Reuse of the existing middle/high school in this zone is also planned. Lands adjacent to Zone 5 are planned to remain undeveloped and preserved as conservation areas. Consequently, the proposed residential and institutional

land uses within this zone would be compatible with existing and planned land uses.

- **Zone 6**
  Proposed development in this zone through Phase II would primarily involve the reuse of existing facilities to improve site access and to complement other land uses on the property. For example, Pier 3 would be reused as a passenger ferry and light cargo terminal while the existing hospital would be used to provide medical services for local residents. Reuse of the fuel storage areas is also planned to support future operations at the airport as well as planned maritime shipping activities. Each of these proposed land uses would be compatible with existing and planned uses on the property.

  A contiguous open space reserve and recreation area is also proposed within Zone 6. This area would provide direct access to the waterfront and occupy significant acreage between and around the fuel storage and delivery facilities, thereby screening these areas from potential future development. Protection of the natural resources in this area is considered a positive direct land use impact of the preferred alternative.

  The DHS would maintain an approximately one-acre area adjacent to the fuel pier for a boat storage and operations facility. This use would be consistent with the planned use of the surrounding waterfront as a passenger ferry and light cargo terminal.

- **Zone 7**
  Planned land use in this zone includes the early development stages of a science park. Initial construction of the science park is planned along the waterfront and would primarily occupy previously developed areas comprising the former Camp Moscrip. This development would be consistent with the existing and planned surrounding land uses.

- **Zone 8**
  Zone 8 is planned entirely as a public open space reserve and conservation area. This use would ensure that existing access to the public beach is maintained and allow enhanced recreational opportunities. Consequently, designation of this zone as an open space reserve and conservation area is considered to have a positive direct land use impact.

- **Zone 9**
  This entire zone, which comprises approximately 3,500 acres of undeveloped land, including approximately 2,100 acres of contiguous mangrove forests and wetlands, is proposed as a conservation area in its entirety. Permanent protection of sensitive natural resources in this area would represent a significant contribution to on-going regional conservation initiatives in Puerto Rico.

External Land Use Consistency

Implementing the Reuse Plan would result in the development of uses compatible with those adjacent to NAPR. Recreation, open space reserves, and industrial land uses are planned for areas adjacent to the primarily residential and undeveloped lands west of NAPR. The proposed industrial land would be buffered from off-site land uses by an open space reserve, which would prevent land use conflicts.

The redevelopment of NAPR would influence the future growth pattern of the nearby municipalities of Ceiba and Naguabo by providing a variety of commercial, service, and industrial employment activities rather than the singular former use of the property as a military base. As development increases on the NAPR property, off-site development would be expected to reflect more urban intensities and densities rather than the current rural residential setting. However, such land use changes would be considered long-term and beneficial impacts in that they would provide considerable economic benefits for communities in eastern Puerto Rico. Therefore, no significant adverse impacts on land use from implementing the preferred alternative would be expected.

4.1.2 Aesthetics

Implementation of the Reuse Plan through Phase II would minimally change the overall aesthetic features of the NAPR property. All of the proposed new development would occur within or immediately adjacent to areas that are already developed; therefore, clearing the vegetated areas would be minimized and fragmentation of undeveloped areas avoided. Landscaping and sensitive design considerations in the development of new structures, which would likely be required in order to comply with specific zoning and site development regulations, could further minimize aesthetic impacts.

The most significant and visible aesthetic features on the property (i.e., mangrove forests and steep-sloped upland coastal forests) would either be permanently protected through designation as Conservation Areas or remain undeveloped. As such, implementation of the Reuse Plan through Phase II would not significantly affect the existing visual or aesthetic quality of the NAPR property.

4.2 Environmental Contamination

Sites with remaining environmental contamination at NAPR fall into the following categories:

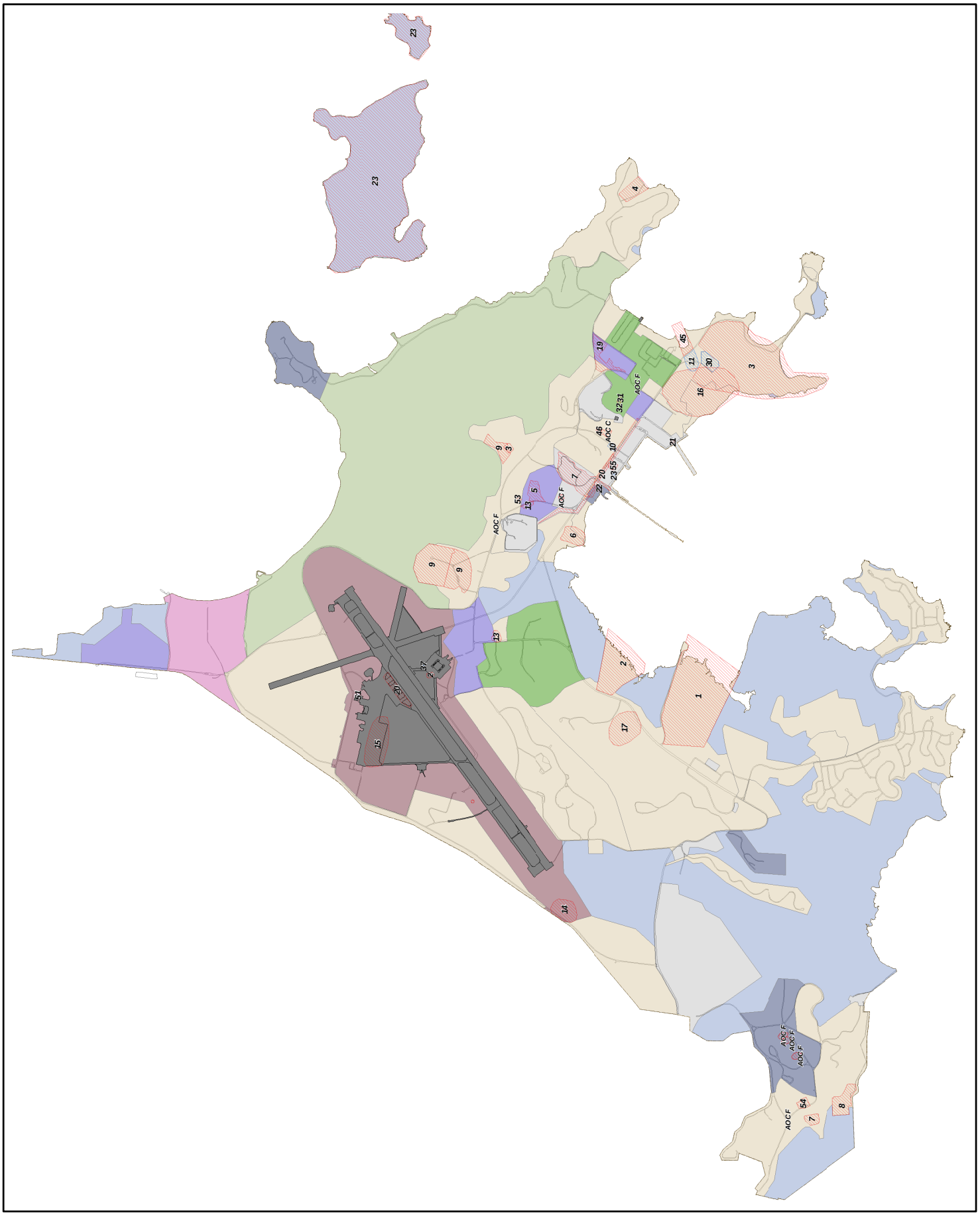
- RCRA sites, including IRP sites and all SWMUs, AOCs, and ECP sites;
- CERCLA sites;
- Tanks, including MNA sites;
- NRDA areas, including the 1999 JP-5 fuel spill area and associated mitigation;
- LBP areas, including LBP concerns associated with buildings designed for family housing; and
- ACM, including ACM concerns associated with all installation buildings.

Based on the Reuse Plan and the ECP, the Navy developed distinct parcels for possible disposal actions. In general, the parcels followed the various zones within the Reuse Plan and consist of lands for public sale, lands being transferred to the Commonwealth of Puerto Rico, and areas not being disposed but whose ownership responsibility is being transferred to another federal agency. The parceling process took into consideration the Reuse Plan but goes one step further in combining areas identified in the ECP as requiring some form of environmental remediation. Another consideration in developing the various parcel boundaries was to retain cleanup responsibility with one entity, be it the Navy or a new owner. Figure 4-2 depicts the parcels as they relate to the remaining sites of environmental concern, including sites with land use controls (Category 2 sites classified as CAC with controls) as well as sites with remaining cleanup requirements (Category 3 sites). Most of the contaminated sites are located in three distinct areas:

- The waterfront along the northeast side of Enseñada Honda, which was the major industrial area of NSRR and is designated for similar port and fueling facilities in the Reuse Plan;
- The airfield and surrounding facilities, which would remain airfield-oriented; and
- The developed area northwest of Enseñada Honda, which contained the Navy Lodge, exchange mall, commissary, bowling alley, gas station, mini-mart, etc., and is designated as a "downtown area" in the Reuse Plan.

Overview of Parcels and Sites with Remaining Environmental Concerns

Figure 4-2



The cleanup of contaminated sites at NAPR is primarily managed under the corrective action portion of the current RCRA Part B permit issued by EPA Region II (SWMU, AOC, ECP sites). The Navy has submitted an application for renewal of the Part B permit. Since base operations requiring the Part B permit are no longer in operation, only the corrective action portion of the permit remains applicable. It is anticipated that the EPA will choose to convert the regulation of corrective action requirements from this permit to a RCRA §7003 Administrative Order on Consent (§7003 Order) prior to property transfer. The Navy and EPA are currently negotiating how this issue will be resolved.

Under the Part B permit (or the succeeding §7003 Order), EPA is the lead agency for all cleanup actions and is the decision-making authority regarding remedy selection. Property that is subject to cleanup requirements of the permit (order) may be transferred prior to completion of cleanup under CERCLA early transfer authority, pursuant to the governor's approval of the early transfer. Upon property transfer, LUCs appropriate to individual sites would be imposed as necessary to ensure the protection of human health and the environment. These restrictions may be viewed as interim, pending completion of cleanup activities. Upon EPA approval of the completion of cleanup at a site, the Navy would modify or remove these LUCs in accordance with the EPA-approved final remedy.

Preferred Alternative

Under this alternative, some parcels could be transferred with LUCs. Implementing this alternative would result in the following:

- Contaminated sites could be transferred earlier under the ETA.
- All sites would be cleaned up to meet historic land uses, defined as former NSRR operations. Thus, an industrial site would be cleaned to industrial risk-based levels.
- The Navy may choose to retain cleanup or pass cleanup responsibility on to the new owner. The Navy would be replaced by the new owner of the permit (or §7003 Order) for those sites where cleanup responsibility is passed to a new owner. The Navy would retain ultimate CERCLA liability in all cases.
- Sites previously completed with LUCs in place would not be reopened but transferred "as-is."

- The new owner could choose to take action to support removing LUCs. This would be between the new owner and the EPA. Reuse/redevelopment activity would be limited only by the specified LUCs and/or the new owner's schedule to reduce or remove the LUCs.

Under the Preferred Alternative, cleanup responsibility for parcels containing sites with remaining cleanup requirements could be handled in two ways: (1) cleanup responsibility would be transferred to the new owner, or (2) the Navy would retain cleanup responsibility. At sites where cleanup responsibility is passed to the new owner, a prerequisite to transfer would be establishment of an acceptable regulatory mechanism between EPA and the new owner. Subject to ongoing negotiations with EPA, it is currently anticipated that each new owner of a parcel where there are remaining cleanup requirements and/or LUCs will get a §7003 Order specifically pertaining to the parcel in question. If the Navy is retaining the cleanup, the §7003 Order for the parcel would be held by the Navy.

The Navy could pass cleanup responsibility to new owners with all parcels to be sold to the public or, if retained as federal property, ownership would be transferred to another federal agency. The Navy would retain cleanup responsibilities for sites contained within parcels that are to be conveyed to recipients via PBCs and Economic Development Conveyances (EDCs). The Navy would also retain cleanup responsibility at sites where contaminants are known or suspected to cross multiple parcel boundaries (based on best available information, as presented in the ECP report), regardless of ultimate parcel ownership.

If the new owner is to perform cleanup, the new owner would be responsible for establishing goals with the EPA and completing cleanup according to the specific requirements of their own §7003 Order, which they would negotiate with the EPA prior to transfer. Cleanup goals would be risk-based and established based on the owner's selection of future use, as approved by the EPA. Where the Navy is performing cleanup, the Navy would identify future use as aligned with current use (i.e., former NSRR operations), as approved by the EPA. New owners wishing to change that use (i.e., to lift any remaining use restrictions) would be responsible for performing any additional work necessary to achieve that goal, as required by the EPA.

The Navy would retain cleanup responsibility for the RCRA site of Piñeros and Cabeza de Perro Islands under the MRP. Under RCRA, Navy conducts the cleanup as lead agency with EPA oversight. Cleanup goals would be designed to meet reasonably anticipated future land use as a wildlife refuge within the constraints of technological feasibility.

Similarly, additional cleanup activities are ongoing for MNAs under the regulation of EPA. The cleanup responsibilities would be retained or passed to the new owner as described for RCRA permit sites as described above.

Mitigation activities associated with the NRDA would continue under Navy responsibility. Because this mitigation is in lieu of site cleanup, no additional cleanup of the spill area would be performed.

LBP in housing has been inventoried and risk assessments prepared according to Federal Property Management Regulations. Similarly, ACM in buildings has been inventoried. Because future owners may choose to reuse buildings in their current configuration, significantly remodel, or demolish buildings to make way for new development, installation structures would be transferred to new parcel owners "as-is." New owners would be required to complete any necessary abatement activities as identified in the LBP and ACM inventories to ensure compatibility with use. A small quantity of friable, accessible, and damaged (FAD) ACM was identified during the ACM survey, and the Navy plans to complete abatement of this material prior to property transfer.

Implementing the preferred alternative with respect to environmental contamination would not result in a significant impact on the environment. In fact, this alternative offers several operational or functional advantages. The cleanup would be controlled by the end users with the appropriate level of cleanup being determined between EPA and the new owner, based on the property owner's desired reuse. In addition, this alternative would allow for rapid redevelopment, with sites being available for reuse as soon as a new owner is established. A new owner accepting cleanup responsibility could tailor redevelopment plans and schedules, taking into consideration remediation requirements, cost requirements, and operable development opportunity. Implementing this alternative would allow the Puerto Rico citizenry an opportunity to reap any potential social, economic, and/or recreational benefit.

4.3 Infrastructure and Utilities

4.3.1 Potable Water Supply and Distribution

It is anticipated that the water supply and distribution system would be transferred to the Puerto Rico Aqueduct and Sewer authority (PRASA) during Phase I of the Reuse Plan. PRASA would be responsible for obtaining a National Pollutant Discharge Elimination System (NPDES) permit and for maintaining the potable water supply and distribution system to meet the standards and treatment requirements under the Safe Drinking Water Act (SDWA), as implemented by the Puerto Rico Department of Health. This law provides for the establishment of primary standards for the protection of the public health and secondary standards relating to the taste, odor, and appearance of drinking water. However, should the PRASA not take over the facilities, these facilities would be closed in accordance with the §7003 Order. The Commonwealth would assume responsibility for supplying potable water. As of December 2003, the water treatment system was meeting all applicable standards for water quality (U.S. Navy March 31, 2005), although recent monitoring data for the treatment plant indicated high levels of trihalomethanes (THMs) (Reuse Plan). THMs are formed when chlorine, which is used as a disinfectant, reacts with organic substances naturally occurring in the raw water. All enforceable maximum contaminant levels for particular contaminants in drinking water, including THMs, would need to be met by PRASA.

The reservoir, treatment plant, pump stations, and distribution lines are considered to be in good working order (e.g., no deficiencies or obvious defects; maintenance records are complete and up-to-date; intended function is performed adequately, etc.), and the treatment plant has adequate capacity to accommodate the peak potable water demand and fire protection that would be needed for the development proposed through Phase II (Reuse Plan). The maximum daily required flow of 4.0 mgd capacity of the treatment plant would not be exceeded during Phase I and Phase II of the Reuse Plan, with a projected workforce of 5,000 and residential population of 2,850 (see Section 4.11, Socioeconomics), considering that the average daily flow of the treatment plant when NAPR was active was 1.0 mgd with a population of more than 7,000 persons. Depending on the location of the new development with respect to existing water mains and the elevation of the new development, new water mains and booster pump stations may be required. In

addition, the components of the system would need to be evaluated for compliance with applicable municipal codes.

A new water main may be required to accommodate industrial development north and south of the existing runway in Zone 1 and in Zone 5 under Phase II. No indirect effects on area resources are anticipated with installation of new water mains. Any installation of new water mains in Zones 1 and 5 should be planned to avoid removal of large vegetation (e.g., trees) in the open space reserves also proposed in these zones, as well as the wetlands south of the airfield in Zone 1, to the extent practicable. If avoiding wetlands is not feasible, installing water mains may require a permit under Section 404 of the Clean Water Act (CWA).

4.3.2 Wastewater Treatment

It is anticipated that the Bundy, Capehart, and Forrestal WWTPs and the wastewater collection and conveyance system at NAPR would be transferred to PRASA during Phase I of the Reuse Plan. PRASA would be responsible for maintaining the wastewater treatment system to meet the standards and treatment requirements of a Section 402 Clean Water Act NPDES permit. The permit would contain limits on pollutant discharge and specify monitoring and reporting requirements and other provisions to ensure that the discharge from the wastewater treatment plants would not affect water quality standards of the receiving waters. However, should the PRASA not take over the facilities, these facilities would be closed in accordance with the §7003 Order. The Commonwealth would assume responsibility for supplying wastewater treatment facilities.

The existing NPDES permit (#PR0020010) for NAPR WWTPs expired in January 2003. However, the Navy filed an application for a permit renewal six months prior to its expiration, and as a result the permit has continued to be operational under an Administrative Continuance. The permit could be directly transferred to PRASA along with transfer of ownership of the wastewater treatment plants, provided PRASA adopts the application for renewal of the permit as its own. However, depending on the uses ultimately served by the WWTPs, PRASA may need to supplement the permit (O'Brien 2005). Specifically, most of the wastewater treated at NAPR has been domestic wastewater. Minimal discharges of industrial wastewater were received at the Forrestal WTTP. Depending on the type and intensity of industrial development realized in Zone 1, condi-

tions of the NPDES permit may need to be amended to provide for pretreatment of industrial discharges.

The WWTPs, pump stations, and collection and conveyance lines are considered to be in good working order (e.g., no deficiencies or obvious defects; maintenance records are complete and up-to-date; the intended functions perform adequately, etc.) with a few exceptions for some individual components of the system. The existing wastewater treatment system has adequate capacity to accommodate the proposed level of development through Phase II of the Reuse Plan, with upgrades necessary only to support collection and conveyance from new development areas. The permitted capacity of the treatment plants (0.65 mgd for the Bundy plant, 1.13 mgd for the Capehart plant, and 1.0 mgd for the Forrestal plant) would not be exceeded during Phase I and Phase II of the Reuse Plan, with a projected workforce of 5,000 and residential population of 2,850 (see Section 4.11, Socioeconomics), considering that the average daily treated flow from the three plants was approximately 1.3 mgd when NAPR was active and had a population of more than 7,000 persons. However, the components of the system would need to be evaluated for compliance with the municipal code (i.e., use of PVC pipes).

To accommodate planned development, a new sewer main may need to be installed. No indirect effects on area resources are anticipated with the installation of new sewer mains. Any installation of sewer mains in Zones 1, 2, 5, and 7 would be planned to avoid removal of large vegetation (e.g., trees) in the open space reserves also proposed for these zones as well as in the wetlands south of the airfield in Zone 1, to the extent practicable. If avoiding wetlands is not feasible, installing water mains may require a permit under Section 404 of the Clean Water Act.

4.3.3 Storm Water

Proposed development activities would result in a slight increase in clearing and in impervious surfaces at NAPR, which in turn could modify the patterns and amount of storm water runoff generated. If uncontrolled, storm water runoff has the potential to adversely affect water quality in the quebradas, mangroves, and marine environments at and adjacent to NAPR through the introduction of sediments, particulates, and toxins.

NPDES storm water permits from the EPA and Control of Erosion and Prevention of Sedimentation (CES) permits from the EQB would be required for construction activi-

ties at NAPR or for disturbances to less than 1 acre that are associated with a larger common plan for development. (NPDES permits also are required for disturbances to more than one acre of land.) Large construction activities in Puerto Rico are eligible for coverage under EPA's NPDES General Permit for Storm Water Discharges Associated with Construction Activity. This permit requires developing and implementing a storm water pollution prevention plan using best management practices to minimize pollutants in storm water runoff. For soil disturbance of more than 9,688 square feet (900 square meters) of land, CES permits require that a soil erosion and sedimentation control plan be prepared and implemented. Compliance with these permit requirements would ensure that storm water is adequately controlled at all construction sites. Consequently, no significant adverse impacts related to storm water runoff are anticipated from implementation of the Reuse Plan.

As discussed in Section 3.3.3, six outfalls at NAPR are regulated under EPA's Multi-Sector General Permit Program. Automatic transfer of permit coverage under 40 CFR 122.61(b) is not allowed for Multi-sector General Permits. New owners may be required to obtain Multi-Sector General Permits or Individual Permits from the EPA for the six outfalls that are currently covered under the NAPR Multi-Sector General Permit or any other outfalls that would receive storm water from industrial activities or sheetflow from industrial areas.

4.3.4 Solid Waste

Disposal of NAPR property would result in the transfer of solid waste management from on-base facilities to off-base facilities. The existing landfill at NAPR would be closed in accordance with RCRA. Therefore, solid waste generated by the land uses proposed at NAPR would be the responsibility of the local municipalities (e.g., Ceiba, Naguabo) using existing facilities currently operated by Landfill Technologies, Inc. Landfill Technologies, Inc. manages municipal solid waste for a population of approximately 187,185 (including the municipalities of Fajardo, Ceiba, Naguabo, and other private and government agencies). Redevelopment of NAPR is projected to increase the population by 2,850 (see Section 4.11, Socioeconomics), which is less than 2% of the population currently being served.

Based on the projected population growth of 2,850 persons and a waste generation rate of 0.7 tons/year/capita (Puerto Rico Authority for Solid Waste August 2004), which averages all residential, commercial, and industrial non-hazardous solid waste for a municipality, an estimated 1,995 tons of solid waste would be generated annually. This would add approximately 1% to the municipal solid waste currently managed by Landfill Technologies, Inc. Therefore, the proposed redevelopment of NAPR under Phase I and II is not projected to significantly impact solid waste management facilities.

4.3.5 Electric Power Systems

The disposal and proposed redevelopment of NAPR under the preferred alternative would not significantly impact the electrical power demand or distribution systems at NAPR. The existing system is adequate to meet the demand of users during the redevelopment proposed under Phases I and II of the Reuse Plan. PREPA, which currently supplies power to NAPR, would likely acquire the electrical power distribution system, including eleven substations.

The substations and distribution lines are considered to be in fair to good working order (e.g., no deficiencies or obvious defects; maintenance records are complete and up-to-date; intended functions are performed adequately, etc.), although these systems may need to be upgraded to current standards upon integration into the PREPA system (Reuse Plan). In addition, with the transfer, PREPA would need to secure the substations and provide vehicle access. The maximum demand of 15,788 kVA and 1,464 kVA, respectively, for the incoming 38 kV circuits (Daguao and airport service lines) when NAPR was active with a population of more than 7,000 persons would not be met during Phase I and II of the Reuse Plan, with a projected workforce of 5,000 and residential population of 2,850 (see Section 4.11, Socioeconomics). However, PREPA would need to provide investments in stepping down the power to meet the redevelopment plans. An estimated 7,450 linear feet of distribution lines and two new substations are proposed to support the Reuse Plan through Phase II.

4.3.6 Transportation

Marine Transportation

Phase II of the Reuse Plan includes the reuse of the recently upgraded Pier 3 at the northeast portion of Enseñada Honda as a new passenger and light cargo ferry terminal with service to Vieques, Culebra, and the U.S. Virgin Islands. The ferry would likely be operated by the PRPA. Ferry service is currently provided from the eastern end of Puerto Rico via a pier in Fajardo, approximately 10 miles north of NAPR. This service is sub-standard due to unreliable scheduling, outdated ferry equipment, and deteriorating infrastructure at the Fajardo terminal and pier (Reuse Plan). A modern passenger ferry terminal on the NAPR property would represent a major improvement to the island's transportation infrastructure. The USACE has previously issued construction and use permits for the existing facilities along the waterfront at NAPR. Therefore, changes to uses that include intensity and operations would require users to obtain a new permit from USACE.

Land Transportation

Implementation of the preferred alternative is not expected to result in significant impacts on the land transportation system. Existing developed areas at NAPR are fragmented throughout the property and are connected by a network of mostly two-lane roads. Since the Navy's facilities were spread throughout the property, roadways currently extend into each zone considered for reuse; therefore, there is no immediate need to construct new roads to access development sites. Preliminary investigation of the transportation network at NAPR indicates that most of the roads are in fair to good condition with a considerable amount of serviceable life remaining (Reuse Plan).

Given the conceptual nature of the proposed reuse, it is not possible to accurately identify the roads and intersections that would be most affected by new development. Detailed site drawings would be needed to analyze potential congestion areas and determine level of service for various roadways. However, based on the following, implementation of the preferred alternative is not expected to result in significant transportation impacts.

- **The existing roadway network has adequate capacity.**
  Existing roadways were sufficient to support the flow of traffic when NAPR was active and had a population of more than 7,000 persons. The NAPR property would have a resident population of 2,850 and a total workforce of 5,000 at the completion of Phase II of the Reuse Plan (see Section 4.11). Considering that the number of vehicle trips following Phase II redevelopment of NAPR would not be significantly greater than when NAPR was active, the roadway network would have adequate capacity to support the level of planned development.

- **Traffic would be distributed over a number of roadways.**
  Consistent with the existing land use pattern, planned development at NAPR is spread throughout the property either within or adjacent to currently developed areas. No single portion of the property is targeted for high-density or multi-use development. Consequently, traffic would tend to be distributed over a number of roadways, which would limit the potential for reduced levels of service or areas of congestion.

- **The increase in traffic would be incremental.**
  The increase in traffic would be incremental as individual developments are approved and constructed. This would allow developers and review agencies (e.g., PRPB and the Permits and Regulations Administration) sufficient time to consider traffic issues related to individual projects and implement appropriate measures to ensure adequate traffic flow.

- **Planned roadway improvements would mitigate potential traffic congestion and improve traffic flow.**
  Planned roadway improvements at NAPR through Phase II of the Reuse Plan include construction of a new overpass access to the airport off PR-53; construction of an approximately 2,800-foot-long, four-lane "Airport Boulevard" from the new overpass access; and expansion of Langley Drive and Antietam Road from two to four lanes. Constructing a direct access route from PR-53 to the planned passenger/cargo airport would significantly minimize the potential for congestion on roadways entering NAPR. In addition, the flow of traffic on internal roadways would be improved by the expansions of Langley Drive and Antietam Road.

4.4 Topography, Geology, and Soils

Construction, operation, and maintenance of the proposed redevelopment through Phase II of the Reuse Plan would have minimum potential impacts on local topography and soils. Because there would be no need for blasting bedrock or major excavation during proposed construction activities, no widespread impacts on local geology are expected. In addition, because the Reuse Plan incorporates measures to minimize development in steep areas, major re-grading activities are also unlikely.

Adverse impacts on local topography would be minor and limited to areas in which landscape grading is required to ensure proper drainage or to areas in which landscape contouring is required to implement erosion control measures. No significant topographic features or areas with steep slopes that require extensive grading exist in the redevelopment areas.

One of the primary concerns regarding future development projects would be soil erosion and sedimentation. Impacts on erodible soils resulting from clearance of vegetation and landscape grading activities would be short-term and moderate. Moderate impacts on soils are expected to occur in areas where the soil erosion potential is high. The soil survey indicates that areas where redevelopment would occur through Phase II of the Reuse Plan are underlain by approximately 178 acres of land with highly erodible soils. These areas of highly erodible soils include 60 acres in Zone 2, 50 acres in Zone 6, 25 acres in Zone 4, 22 acres in Zone 5, approximately 10 acres in each of Zones 1 and 3, and 0.8 acre in Zone 7. No highly erodible soils would be disturbed in Zone 8.

Soil erosion and sedimentation impacts on highly erodible soils would be minimized by implementing soil erosion, storm water runoff, and sediment control measures required under federal and Commonwealth law (as described below), including use of appropriate best management practices during clearance and construction activities (e.g., clearing only small tracts of land at one time and minimizing the length of time that cleared areas would be void of vegetation).

Large construction activities would be subject to EPA's NPDES storm water permit requirements, which are designed to minimize soil erosion from storm water runoff. As defined in 40 CFR 122.23 (b)(14)(x), projects that include clearing, grading, and excavation activities that would disturb more than five acres of land or that would disturb less than five acres but which are part of a larger common plan of development, would require an NPDES storm water permit. Large construction activities in Puerto Rico are eligible for coverage under EPA's NPDES General Permit for Storm Water Discharges Associated with Construction Activity. This permit requires developing and implementing a storm water pollution prevention plan using best management practices to minimize pollutants in storm water runoff.

Although proposed redevelopment would be designed to minimize impacts to soil resources and to protect sensitive ecological areas, land larger than 0.22 acre probably

would be developed. Therefore, in compliance with Commonwealth of Puerto Rico environmental laws, any development project that involves clearing or soil disturbance of more than 0.22 acre (9,688 square feet [900 square meters]) would require a Permit for Control of Erosion and Prevention of Sedimentation. This permit is issued by the Puerto Rico EQB and would need to be obtained by any party proposing a specific redevelopment activity. To meet the requirements of this permit, a Soil Erosion and Sedimentation Control Plan would be required for each proposed redevelopment project in excess of 0.22 acre to prevent and minimize impacts on soils. The plan would identify soil erosion measures and best management practices to minimize sedimentation and to ensure that the effects of construction and maintenance of the proposed projects on soil erosion and sedimentation would be minor. The developers would be responsible for obtaining construction permits and for implementing erosion and sediment controls.

4.5 Hydrology and Water Quality

4.5.1 Surface Water

Grading and clearing activities during construction of the planned developments could affect surface water. Potential impacts would be associated with alteration of natural drainage systems, changes in surface runoff patterns, soil erosion and sedimentation, and introduction of contaminants. Impacts on surface waters could also potentially occur during the operation of the new facilities.

As discussed in Section 3.5.1, development and changes in land use in the areas surrounding NAPR have resulted in an increase in the amount of surface water reaching NAPR, and as a result the surface waters at NAPR are subject to ponding, erosion, and dramatic flooding. Currently, the majority of the area surrounding surface water features is undeveloped. Existing vegetation in these areas slows flow velocity and stabilizes stream banks, which attenuates flooding, increases groundwater recharge, and offers some protection against erosion. These vegetated areas also act as filters that trap sediments and contaminants.

The majority of redevelopment through Phase II is within areas that were previously developed, thereby minimizing impacts on these undeveloped buffer areas. However, new development in Zones 1 through 7 could affect vegetative communities and wetlands that act as buffers between existing development and the surface waters at

NAPR. (A more detailed discussion of impacts on vegetation is provided in Section 4.8, Terrestrial Environment.)

- **Rio Daguao Drainage System**
  The majority of new development through Phase II would occur in the areas immediately adjacent to the airport in Zone 1. New industrial development planned for this area extends up to the boundary of freshwater wetlands associated with unnamed tributaries to Quebrada Seca and the downstream portions of the Rio Daguao drainage system. It is assumed that this type of land use would result in much of the affected area being converted from natural vegetation to impervious surfaces. The removal of vegetation and the addition of impervious surfaces has the potential to exacerbate flooding and erosion problems in the Rio Daguao drainage system and to result in the introduction of pollutants from paved areas. New residential development planned for Zones 4 and 5 would occur immediately adjacent to the Daguao mangrove forest. Development in these areas would result in alteration of runoff patterns and the flow of surface water in this area. Removal of the vegetative buffer between existing development and this sensitive community has the potential to result in impacts on water quality in the mangroves and in the marine waters beyond the mangroves.

  Any planned development at the southwest end of the runway would result in alteration of the 100-year flood plain.

- **Quebrada Aquas Clara Drainage System**
  Planned new industrial development adjacent to the north end of the runway, in Zone 1, would result in potential impacts on Quebrada Aquas Clara. The removal of vegetation and addition of impervious surfaces would likely affect surface water hydrology and quality as described above for the Rio Daguao drainage system. No other development is planned within the Quebrada Aquas Clara Drainage System. No impacts on the 100-year flood plain are anticipated as a result of planned development through Phase II.

- **Quebrada Ceiba Drainage System**
  The land at NAPR within the Quebrada Ceiba Drainage System is included in Zone 8. No development is planned for Zone 8 through Phase II of the Reuse Plan. Therefore, no impacts on the Quebrada Ceiba Drainage System or the 100-year flood plain are anticipated through Phase II.

- **Other Drainage**
  Residential development in Zone 2 would occur immediately adjacent to the freshwater wetlands associated with the unnamed tributary to Quebrada Palma that flows through NAPR. Development has the potential to result in impacts on water quality associated with removal of the vegetative buffer between development areas and the wetland and with changes in surface water flow patterns that would result from development up to the boundary of the wetland

area. No impacts on the 100-year flood plain are anticipated in association with development in the vicinity of Quebrada Palma.

New university and mixed density residential development in Zones 4 and 5 would occur up to the boundary of the mangrove forests associated with Enseñada Honda. This development would result in potential impacts on surface water flow and water quality resulting from changes in surface water flow and the removal of vegetative buffers.

Each of the potential impacts on surface water discussed above would be minimized or mitigated through the use of best management practices during construction; through development and implementation of storm water pollution and prevention plans for development; and through appropriate treatment prior to discharge of contaminants. Any required development permits would be the responsibility of the developer. These include but are not limited to NPDES storm water permits from the EPA and CES permits from the EQB for construction activities at NAPR. NPDES permits are required for disturbance of more than one acre of land or disturbance of less than one acre that is associated with a larger common plan for development. Large construction activities in Puerto Rico are eligible for coverage under EPA's NPDES General Permit for Storm Water Discharges Associated with Construction Activity. This permit requires developing and implementing a storm water pollution prevention plan using best management practices to minimize pollutants in storm water runoff. For soil disturbance of more than 9,688 square feet (900 square meters) of land, CES permits require that a Soil Erosion and Sedimentation Control Plan be prepared and implemented.

With implementation of the above best management practices and storm water treatment measures, construction and operation of the facilities proposed through Phase II of the Reuse Plan are not expected to result in significant adverse impacts on surface water.

4.5.2 Groundwater

As discussed in Section 3.5.2, it is unlikely that aquifers at NAPR would provide an adequate quantity for use as a water supply, and the water quality classification indicates that the groundwater is not fit as a source for drinking water supply. Therefore, it is assumed that redevelopment would not involve significant withdrawal of groundwater for a water supply.

Construction and operation of new facilities have the potential to result in impacts on groundwater recharge and discharge and on water quality. The addition of impervious surfaces associated with new development would create a barrier between groundwater and surface water that may result in alteration of groundwater recharge and discharge patterns. This is of particular concern in Zone 1, where industrial development is likely to result in a significant increase in impervious surfaces surrounding drainage channels that are already subject to flooding. (Approximately 27% of undeveloped land in Zone 1 would be modified through new industrial development.) The existing vegetation in these areas slows surface water, which increases the potential for groundwater recharge. The addition of impervious surface without the development and implementation of a storm water management plan that replaces the groundwater recharge function would exacerbate existing groundwater/surface water exchange problems in this watershed. The potential for discharge of contaminants and their introduction to groundwater in association with construction and operation of new development, particularly industrial facilities, also exists.

Impacts on groundwater would be minimized or mitigated through compliance with NPDES and CES permit requirements, which require using best management practices during construction and developing and implementing storm water pollution and prevention plans for new development. Based on the anticipated compliance with these permitting programs by future developers, construction and operation of the facilities proposed through Phase II of the Reuse Plan are not expected to result in significant adverse impacts on groundwater.

4.6 Air Quality

Transfer of the NAPR property likely would result in negligible direct impacts on air quality. Since NAPR is a closed facility, emissions generated at NAPR after disposal would be expected to increase with reuse of the property, resulting in a slight reduction in air quality. In general, air emissions from the facilities at NAPR during the proposed reuse through Phase II are not expected to increase above the levels of the former NSRR.

Impacts on air quality due to reuse and/or redevelopment of the disposed land may occur within certain land use categories. In general, the greater the degree of development of land areas for human habitation or commercial use, the greater the air quality im-

pact would be. Until specific redevelopment plans defining specific facilities to be constructed are developed, only general statements about potential air quality impacts can be made based on proposed land use categories.

Proposed uses such as the airfield, port, or other industrial operations likely would result in the most emissions and air quality impacts relative to other potential land uses such as residential housing, tourism, or conservation. Air pollutant emissions of fugitive dust and engine exhaust likely would occur during any construction projects associated with the proposed reuses. As these areas come into routine use, emissions associated with daily civilian activity would begin. These emissions generally would include heavy equipment exhaust from demolitions, vehicle exhaust for residential areas, and small quantities of air pollutants released from light commercial facilities that may be developed. Light commercial facilities could include gasoline stations, dry cleaners, and other operations serving the public. In general, these types of air pollutant sources are small and distributed over a developed area. Development with this characteristic tends to result in negligible or minor impacts on air quality because any facilities producing emissions are not densely concentrated in one area. The effect of these actions is not expected to adversely affect the region's designation as an attainment area.

4.7 Noise

The direct impact of the proposed action would be a general increase in the ambient noise levels at NAPR because NAPR is currently a closed facility. As reuse activity levels increase with the implementation of the Reuse Plan through Phase II, noise levels would be expected to rise to near the historic levels at NSRR. Depending on the final type of aircraft and number of air operations that would be conducted at the airfield, noise levels in the immediate vicinity of the airfield may exceed 70 to 75 DNL. Care should be taken that the proposed land uses in the vicinity of the airfield incorporate the appropriate noise-attenuation measures. Vehicle traffic or occasional operation of equipment such as backup electrical generators may generate noise. The noise levels would not exceed historic levels and are not expected to adversely impact future development on the disposed land.

Most noise impacts associated with the disposal of NAPR are considered indirect impacts. That is, the potential noise-generating activities would be the result of redevel-

opment of the transferred land. Indirect noise impacts could result from several land uses. The management of conservation zones or other conservation-oriented uses would not be expected to result in any significant noise-generating activities because of the low-impact nature of this land use. Operation of the airfield and port areas, particularly in the early stages of redevelopment when demolition and construction projects would be conducted, would result in noise impacts in the vicinity of these transport hubs. Construction noise associated with development in non-conservation areas would cause temporary, short-term noise impacts in localized areas. Residential and/or light commercial development in certain areas potentially would generate noise commonly associated with this land use type, e.g., vehicle traffic noise and various noises generated by fans, air conditioners, and home maintenance equipment. Low-density developed urban areas may experience average sound levels ranging from 45 dB to 50 dB. More concentrated urban development may cause sound levels approaching 60 dB or higher.

4.8 Terrestrial Environment

4.8.1 Vegetation

Impacts on terrestrial habitat resulting from implementing the Reuse Plan through Phase II would be minimized by using previously developed areas and by siting new development immediately adjacent to previously developed areas. Redevelopment activities would occur primarily in areas that were previously developed and, as a result, impacts on terrestrial vegetative communities would be minimal. However, in some areas new development would be within or immediately adjacent to sensitive stream, wetland, or marine resources.

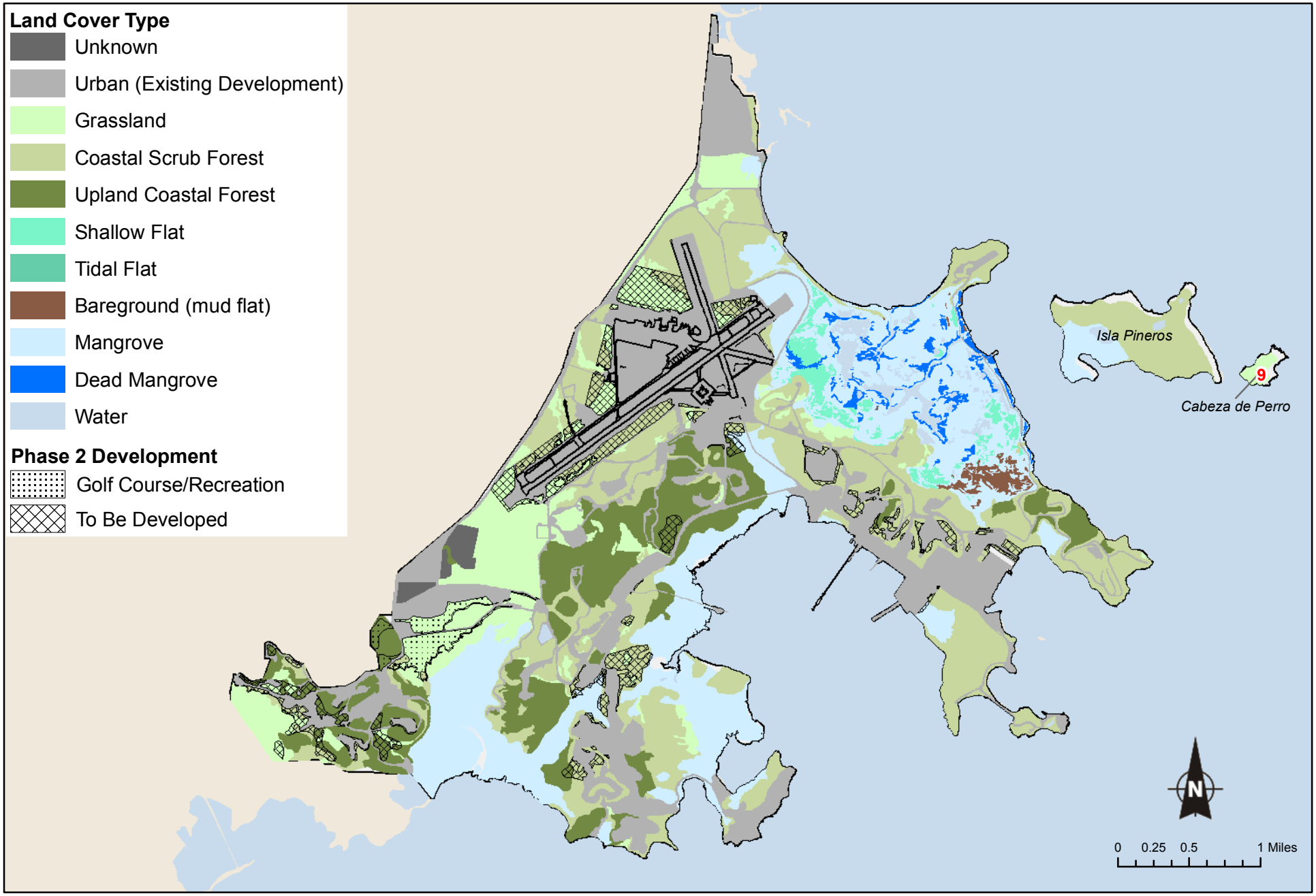
Proposed construction activities could result in the long-term loss or alteration of up to approximately 8% of the undeveloped land at the base. However, this is a maximum impact acreage based on the proposed outline of development areas. In some areas impacts would likely be less. For example, Phase II includes reuse of the airport in Zone 1 and encompasses the land up to the existing airfield fence line. Shrub and grassland communities within the airfield fence-line are not likely to be impacted by reuse of the airport. In other areas, site development plans would likely be prepared that maximize the use of existing cleared area and minimize encroachment into vegetated areas.

Maximum potential impacts on vegetative communities based on complete ground disturbance have been assessed by zone through geographic information system (GIS) analysis and are presented in Table 4-2. Areas of new development within each zone are shown on Figure 4-3.

Table 4-2 Maximum Potential Impacts to Vegetative Communities Associated with Build-out Through Phase II of the Reuse Plan

	Vegetative Cover Type						
Zone	Grassland (acres)	Coastal Scrub Forest (acres)	Upland Coastal Forest (acres)	Wet Meadow (acres)	Wet Coastal Scrub Forest (acres)	Mangrove/ Tidal Wetlands (acres)	Total (% of Previously Undeveloped Land in Zone Impacted)
Zone 1	127	106	0	2	1	0	236 (27%)
Zone 2	22	19	41	<1	0	0	82 (32%)
Zone 3	0	0	0	0	0	0	0 acres (0%)
Zone 4	2	13	21	0	<1	3	39 (5%)
Zone 5	5	48	3	0	<1	3	59 (21%)
Zone 6	0	36	2	0	0	1	39 (38%)
Zone 7	0	11	0	0	0	0	11 (2%)
Zone 8	0	0	0	0	0	0	0
Zone 9	0	0	0	0	0	0	0
Total	**156**	**233**	**67**	**2**	**1**	**7**	**466 (8%)**

In Zone 1, planned industrial development would affect approximately 75 acres of terrestrial vegetation that is primarily grassland. In Zone 2, planned development would affect terrestrial communities immediately adjacent to freshwater wetland areas along the west boundary of Zone 2 that are associated with the Quabrada Palma drainage system. In Zone 4, planned development would affect terrestrial vegetation immediately adjacent to mangrove communities in the Daguao forest and mangrove communities associated with Enseñada Honda. In Zone 5, planned development would affect terrestrial communities immediately adjacent to mangrove communities in the Daguao forest and immediately adjacent to mangrove communities associated with Enseñada Honda.



Source: Geo-Marine, 2005; ESRI, 2004

Figure 4-3
Phase II Development
Naval Activity Puerto Rico

Upland areas adjacent to wetland communities offer greater habitat value due to their proximity to wetlands. In addition, removing upland coastal scrub forests, scrub forests, and grasslands, which slow flood waters and protect against erosion, or adding impervious surfaces, have the potential to affect water quality, resulting in impacts on the freshwater wetlands, streams, and downstream tidal and marine communities. (Water quality impacts are discussed in detail in Section 4.5 above.)

Zone 9 comprises approximately 3,500 acres, the majority of which are sensitive freshwater wetland and tidal wetland communities. The Reuse Plan designates these areas as conservation areas. The Navy proposes to transfer these areas to the Commonwealth of Puerto Rico. These vegetated areas currently serve to slow surface water flow, allow recharge of groundwater and, in some areas, buffer the impact of torrential rains and flash flooding that result from the steep slopes and type of land use outside NAPR. They also function as filters to trap chemicals and sediments that could otherwise harm freshwater wetlands, coral reefs, and sea grass beds.

Any proposed development would be reviewed by the DNER for compliance with Puerto Rico Law No. 241, which regulates impacts on flora and fauna. Compliance with this law would minimize impacts on vegetative communities on the NAPR property. Therefore, no significant adverse impacts on vegetative communities are expected.

4.8.2 Wildlife

Terrestrial wildlife species are closely associated with vegetative communities. For this reason, the loss of vegetation and modifications to land use, as discussed above, would also affect the wildlife communities at NAPR. Potential impacts on terrestrial wildlife would be primarily from destruction of habitat due to clearing and grading during construction and maintenance of future development projects. Potential impacts would range from minor temporary impacts associated with displacement to long-term impacts associated with loss or alteration of habitat.

Wildlife species may be temporarily displaced in peripheral areas during construction, when noise and human activity levels increase. However, once construction has been completed, the distribution of wildlife in these peripheral areas should be similar to distributions associated with pre-construction conditions. Consequently, such impacts would not be significant.

As noted above, a maximum of approximately 466 acres of vegetation could be removed by implementing the Reuse Plan through Phase II. Considering that the amount of vegetation that would be permanently removed comprises less than 8% of the total vegetation on the property, no long-term adverse impacts on wildlife associated with loss of habitat are expected.

4.9 Marine Environment

4.9.1 Essential Fish Habitat

An EFH assessment, including field surveys, characterization of the sites, effects of the proposed action, and recommended mitigation as a follow-on action by future land owners and Commonwealth agencies, was conducted for the NAPR property by GeoMarine, Inc. (May 2005). (For more details see the EFH Assessment report [Appendix B].)

Implementation of the proposed action, the disposal of NAPR property to non-federal property owners, would not in and of itself adversely affect EFH. However, after completion of the proposed action, future land-use changes could affect listed species. Because of the speculative nature of the Reuse Plan, the potential for an effect on EFH, if any, cannot be addressed. Under existing laws and regulations, future landowners/developers would be responsible for establishing zoning and applying for building permits and other approvals to implement their respective development projects. A USACE permit would be required for projects located in the water or in wetlands. The USACE has previously issued construction and use permits for the existing facilities along the waterfront at NAPR. Therefore, changes to uses that include intensity and operations would require users to obtain a new permit from USACE. The engineering, design, and studies needed to obtain the various approvals from the respective regulatory agencies have not been accomplished. Therefore, discussions of potential effects on EFH are not quantifiable.

This EA, while addressing the disposal action, does not preclude the potential need for future review of specific components of the Reuse Plan pursuant to federal and Commonwealth laws. All Puerto Rican entities must comply with relevant federal laws (e.g., the Clean Water Act and Clean Air Act) and Commonwealth planning, zoning, and environmental laws. While the future potential impacts on EFH are not quantifiable, the

Navy has determined that existing federal laws and Commonwealth rules, regulations, and laws, as well as the Special Zoning which would be established by the PRPB, would provide adequate protection such that the disposal of NAPR to the Commonwealth and other non-federal entities would not result in an adverse direct or indirect effect on EFH.

- **Coral Reefs**
  Implementation of the preferred alternative would not directly impact coral reefs. However, as discussed below, coral reefs could be indirectly affected by removing public use restrictions in the waters around NAPR and by the planned developments within NAPR.

  - **Zone 1**
    Because the airfield is located away from the immediate coastline and within multiple watersheds, it is not known where runoff from reuse and development of the airfield would be directed nor the localized bodies of water that would experience the greatest effects. However, since water quality degradation can migrate, all coral reefs within surrounding waters could potentially be indirectly affected. Current storm water regulatory requirements for construction sites are designed to minimize these impacts.

    Runoff may impact coral reefs by many routes, the most harmful being increased turbidity and decreased oxygen. The magnitude, extent, duration, and reversibility of impacts depend upon runoff intensity. Obviously, the impact is made more severe by increasing the volume of the contributing constituent reaching open water. At this point in the planning process, predicting runoff rates by volume would be impractical.

  - **Zone 2**
    Few mapped coral reef areas lie in the waters surrounding the Degauo mangrove forest, which is adjacent to Zone 2. The closest coral reef is approximately one mile southwest of shore. Outer reef areas do not necessarily experience elevated loads of land-derived nutrients via surface water flow but do experience moderately elevated nutrient levels in near-shore waters. Given the distance from shore, these coral reefs are not likely to experience increased nutrient loads.

  - **Zone 3**
    The construction phase during expansion of the golf course could be a contributor to runoff, resulting in decreased water quality. This impact would be temporary, lasting only for the duration of construction. Operation of the expanded golf course would not contribute as much runoff as an impervious development encompassing the same acreage because storm water is allowed to infiltrate into the soil, decreasing runoff.

The coral reefs nearest to the golf course expansion are those referred to in the Zone 2 discussion. Because of the distance from shore, potential impacts on coral reefs due to Zone 3 expansion and reuse are considered negligible.

- **Zone 4**
  Due to the presence of significant buffers, i.e., mangroves between Zone 4 and the coastline, potential impacts on coral reefs from reuse within this zone are considered minimal.

- **Zone 5**
  Zone 5 could be developed in an area that lies adjacent to habitats of colonized bedrock and aggregated and individual patch reef. There is no mangrove buffer between proposed developments and the adjacent waters containing the coral reefs. These areas would also become more accessible to humans, who can potentially cause severe damage to coral reefs by touching, trampling, and collecting.

- **Zone 6**
  Development and reuse of the port facility could impact coral reefs by various routes, including increases in vessel traffic and accidental fuel or oil spills. Implementing the Reuse Plan may result in an increase in recreational boating and introduction of ferry services in the waters around NAPR. Commerce from these activities could include fishing and diving charters running out of the harbor area, both of which could increase human activities directly around coral reefs. This could cause stress on nearby reefs, which are currently buffered by a restricted-waters zone. Increased vessel traffic would also increase the potential of vessel-related groundings on coral reefs, increased wave action, increased sediment suspension, and water quality degradation from vessel motors. The EFH Assessment (see Appendix B) lists mitigation measures that could be implemented by future property owners or Commonwealth agencies to minimize any potential impacts on coral reefs as a result of future development. With implementation of these mitigation measures no significant adverse impacts on coral reefs near Zone 6 from the proposed action are anticipated.

- **Zone 7**
  The only component of Zone 7 development and reuse that lies adjacent to coral reef habitat is a science and research park development. The goal of the science and research park is to educate while conserving and protecting by all realistic means possible. Therefore, construction and operation of this facility suggests that all practices necessary to protect adjacent coral reefs would be implemented, resulting in minor impacts.

- **Zone 8**
  The open recreation areas proposed for the north entrance area would impact the linear coral reefs located approximately 0.5 mile east of the coast.

Allowing increased access to this area would attract more vessels that could potentially run aground on the nearby reef, along with the other vessel-related factors described in Zone 6. In addition, increased access would also impact the nearby linear coral reef.

- **Zone 9**
  Some facilities may be built within conservation areas to improve public access. Such facilities would be required to undergo the USACE permit process prior to construction. Similar impacts could result from water quality degradation and human contact as addressed in the zones noted above, although on a much smaller scale. Impacts are expected to be minor.

Potential impacts on coral reefs associated with water quality degradation as discussed above are expected to be a temporary and minor, given that the greatest runoff potential occurs if sediments are exposed. Reuse and operation of existing and new facilities would also increase runoff potential; however, CES permits would be required from the EQB for activities disturbing areas of 9,688 square feet (900 square meters), and NPDES permits would be required from the EPA for construction projects affecting one or more acres of land. Compliance with these laws during development and reuse of properties would avoid or minimize potential impacts from sediments and contaminant-laden runoff.

Coral reefs are also protected locally by Puerto Rico Law No. 147 (July 15, 1999), the Law for the Protection, Conservation, and Management of Puerto Rico Coral Reefs. This law requires government agencies of Puerto Rico to consult with the DNER regarding proposed development or construction that might impact coral reefs and related ecosystems.

Potential adverse impacts on coral reefs resulting from increased human activities in marine areas around NAPR could be avoided by mitigation measures that could be implemented by future property owners or Commonwealth agencies to minimize any potential impacts on coral reefs as a result of future development. Such possible mitigation measures are listed below (see Section 4.9.2 and the EFH Assessment in Appendix B). With implementation of these mitigation measures, no significant adverse impacts on coral reefs from the preferred alternative are anticipated.

■ **Sea Grass Beds**
Implementation of the preferred alternative would not directly impact sea grass beds. However, as discussed below, sea grass beds could be affected by removing public-use restrictions in the waters around NAPR and by the planned developments within NAPR.

Decreased water quality could result from additional runoff and discharge from redeveloped areas during construction and operation. Runoff may impact sea grass beds via many routes, the most harmful being increased turbid-

ity, sedimentation, and nutrient runoff. Increased turbidity reduces light penetration, resulting in lower productivity and/or impaired viability of sea grass beds. Sedimentation resulting from increased runoff could smother sea grass beds. Nutrient-rich runoff could affect sea grasses by increasing the potential for algae blooms, increasing oxygen demand and suffocating sea grasses.

CES permits would be required for activities disturbing areas of 9,688 square feet (900 square meters) under Puerto Rico Environmental Laws (formerly Law No. 9). Compliance with this and other Commonwealth and federal laws during development and reuse of properties would avoid or minimize potential impacts from sediments and contaminant-laden runoff. The law requires government agencies of Puerto Rico to consult with the DNER regarding proposed development or construction that might impact sea grass beds and related ecosystems.

Adverse impacts on sea grass beds from increased runoff would also be minimized by the filtering capacity of the extensive mangrove systems at NAPR: the Deguao mangrove forest would act as a buffer for the expansive sea grass beds located in the waters near the Bundy development and would filter the nutrient-rich runoff from the golf course expansion; the Enseñada Honda mangrove would filter runoff from planned residential development in Zone 5 before the runoff reaches Enseñada Honda and other open waters supporting sea grass beds.

Increased vessel traffic in the waters surrounding NAPR could increase the potential for vessel-related groundings or scarring in sea grass beds, sediment suspension, and human contact and could potentially cause water quality degradation from vessel motors. A fuel or oil spill would impact sea grasses by degrading the water quality or by the fuel or oil coming in direct contact with sea grasses. However, since fuel will float on water, only those sea grasses within the tidal zone would have the potential to come in direct contact with spilled fuel.

The open recreation areas proposed for the north entrance area could impact the adjacent sea grasses. Allowing increased access to the area would attract more vessels, increasing the potential of prop-scarring within the sea grasses, along with the other vessel-related factors described above. Increased human activity could also result in increases in discarded solid waste such as bags and bottles. This solid waste could enter the water and smother sea grasses. People could walk on sea grass beds, causing physical disturbance and compacting sediments, leading to sea grass bed regression. These impacts would mainly be limited to the surf zone and shallow waters where most beach activity would take place, which would account for only a small percentage of sea grasses within the area. Potentially adverse impacts on sea grass beds resulting from increased human activities in marine areas around NAPR could be avoided by implementing the mitigation measures listed in the EFH Assessment (Appendix B). Therefore, impacts on sea grass beds from non-vessel related activities within Zone 8 are expected to be minor.

■ **Mangroves**

Implementation of the preferred alternative would not directly impact mangroves. However, as discussed below, mangroves could be affected by removing public-use restrictions in the waters around NAPR and by the planned developments within NAPR.

- **Zone 1**

  Impacts on mangroves resulting from reuse and development of the airfield could occur because of additional runoff and discharge from redeveloped areas during construction and operation. It is not known where runoff from reuse and development would be directed or which localized bodies of water would feel the greatest effects. However, since water quality degradation is a migratory impact, all mangroves within surrounding waters would be affected, although at varying scales of magnitude. The Los Machos mangrove forest would be the area most susceptible to impacts to the airfield and known refueling sectors.

  Accidental discharges or spills of fuel would significantly impact mangroves. Runoff and fuel spills could affect mangroves by many routes, the most harmful being excess high sediment loads and direct contact with hydrocarbons. The lenticels in the mangrove roots (lenticels allow mangroves to breathe) are susceptible to clogging by hydrocarbons and similar pollutants. Sewage, toxic materials, pesticides, herbicides, and suspended or floating substances can suffocate, reduce light, and reduce species diversity in the mangroves. Although mangroves help filter run-off from adjacent lands, excesses of contaminants, especially hydrocarbons, can damage mangroves by fouling lenticels (Proffitt et al. 1999). All mangrove impacts occurring from Zone 1 reuse and development are expected to be minor. No mangrove areas would be filled for development, and proper measures would be taken to reduce and minimize runoff.

- **Zone 2**

  Expanding currently developed areas in Zone 2 into current undeveloped tracts would reduce the upland buffer associated with the Deguao mangrove forest. This could potentially stress the mangrove forest by causing increased runoff from paved areas. In addition, paved areas contribute to oils and other pollutants that can clog mangrove lenticels. However, all mangrove impacts occurring from Zone 2 reuse and development are expected to be minor, given the relatively small area to be developed. In addition, no mangrove areas would be filled for development.

- **Zone 3**

  Expanding the golf course in Zone 3 would have impacts on mangroves similar to those identified for Zone 2. Although no mangrove acreage would be developed, the existing golf course is adjacent to the Deguao mangrove forest. The construction phase of expansion could be a contributor to runoff. During construction, a greater potential exists for runoff

to carry increased sediments and/or contaminants, resulting in decreased water quality and increased sedimentation. The construction phase would be temporary and, subsequently, the key phase of run-off contribution. However, pesticides and fertilizers are also known to foul mangrove lenticels (Proffitt et al. 1999). Increases of these contaminants could mostly affect the Deguao mangrove forest, as could the Bundy development. However, impacts are expected to be minor.

- **Zone 4**
  Construction and operation of facilities in the downtown area would increase runoff and sedimentation via the same routes described in Zones 1 and 2. However, impacts on mangroves are expected to be minor, given the relatively small area affected. In addition, no mangrove areas would be filled for development.

- **Zone 5**
  Zone 5 would be developed in an area that lies adjacent to two mangrove forests, Enseñada Honda forest and Deguao forest. The impacts on these two mangrove tracts would be similar to the impacts in Zones 1, 2, and 4.

- **Zone 6**
  Development and reuse of the port facility could potentially impact mangroves as a result of an increase in vessel traffic and accidental fuel or oil spills. Increased vessel traffic would increase the potential of vessel-related impacts, e.g., increased wave action, increased sediment suspension, increased human contact, and water quality degradation from vessel motors. A fuel or oil spill would impact mangroves by degrading water quality and, potentially, by fuel or oil coming in direct contact with mangroves.

- **Zone 7**
  Developing new facilities and reusing existing facilities could impact mangroves in a manner similar to that described for Zones 1, 2, 4, and 5. The Los Machos mangroves have the greatest potential of being affected by development and reuse within Zone 7, a science and research park development. The goal of developing a science and research park is to educate while conserving and protecting by all realistic means possible. Therefore, the construction and operation of this facility would suggest that all practices necessary to protect adjacent mangroves would be implemented, resulting in minor impacts.

- **Zone 8**
  The open recreation areas proposed for the north entrance area could potentially impact the adjacent mangroves. Allowing increased access to this area could attract more vessels and human activity. Human accessibility could increase compaction of soils, which can lead to mangrove regression. However, this area is currently accessible by the public and all impacting factors are in place, although at a relatively smaller scale. Further

impacts are expected to be minor due to the type of impact and proximity of the mangrove to the center of the proposed recreation area. In addition, no mangrove areas would be filled for development.

- **Zone 9**
  Some facilities could be built within conservation areas to improve public access. Impacts from increases in human activity would be similar to those discussed under Zones 1, 2, 4, 5, and 8, although on a smaller scale.

Compliance with Commonwealth and federal environmental laws (which include Puerto Rico Law No. 147, the Marine Mammal Protection Act, and the Magnuson-Stevens Fishery Conservation and Management Act) during development and operation of the planned facilities would lessen or prevent any potential adverse impacts on mangroves. As required by these laws, applicable best management practices would be implemented during construction phases to control runoff and lessen the potential for hydrocarbons to enter mangroves. In addition, post-construction runoff would be minimized by properly designed storm water systems. Pre-existing and new developments would be designed to direct runoff into detention areas, where runoff would be allowed to infiltrate into the soil instead of running over land and into the marine environment.

With implementation of the above best management practices and storm water treatment measures, construction and operation of the facilities proposed through Phase II of the Reuse Plan are not expected to result in significant adverse effects on mangroves. More significantly, the Reuse Plan designates all of the approximately 2,100 acres of mangroves at NAPR as conservation areas. Under the Reuse Plan, conservation areas would be excluded from future development activities. Permanent preservation of the extensive mangrove system at NAPR is considered a positive reuse.

■ **Fish and Shellfish**
Potential impacts on fish and shellfish would primarily be associated with impacts on various marine habitats, including coral reefs, sea grass beds, and mangroves. As noted previously, impacts on these resources are generally expected to be short-term and minor. Consequently, no significant adverse impacts on fish and shellfish as a result of habitat alterations would occur from implementing the preferred alternative.

Impacts on fish and shellfish could also potentially occur due to increased boat usage in the waters adjacent to NAPR. This increase in boat usage could potentially lead to an increase in fishing, which in turn would increase the recreational or commercial harvest of these resources. However, fishing in the coastal waters of Puerto Rico is managed by the DNER under Commonwealth Law No. 278 (November 29, 1998) and its associated fisheries regulations and Administrative Orders. Under the management of the DNER, the increase in fishing that would potentially occur under disposal and subsequent reuse scenarios would not be expected to adversely affect fish and shellfish resources.

4.9.2 Suggested Conservation Guidelines for Future Property Owners

The transfer of NAPR property to federal agencies and disposal to other future property owners would not in and of itself result in impacts on EFH. Therefore, no Navy-instituted mitigation measures are proposed.

There are a number of mitigation measures that Commonwealth and/or federal resource agencies could/may impose on properties being transferred out of federal ownership to non-federal owners/developers before development-specific approvals or permits are issued to these non-federal owners/developers. Implementation of these mitigation requirements would be the responsibility of the new owner/developer, and the respective issuing agency would be responsible for ensuring that mitigation measures are instituted. The Navy would no longer retain any ownership or control of these properties.

Following is a list of conservation guidelines that could be implemented by future property owners or Commonwealth agencies to minimize any potential impacts on EFH as a result of future development:

- Prevent nutrient loading of Pelican Cove, Enseñada Honda, and Bahia Puerca;
- Contain (prevent the dispersion of) loose sediments generated during construction;
- Develop a sea grass/mangrove/manatee/sea turtle education program (certification) for construction contractors, ferry vessel operators, and property managers;
- Monitor environmental impacts on EFH during and after the construction phase of projects;
- Develop a long-term sea grass-monitoring program for Pelican Cove, Enseñada Honda, and Bahia Puerca (the condition of sea grasses will be indicative of local water quality);
- Create a clearly marked and buoyed (mandatory channel) for the approach to the ferry terminal(s) and other marine activities;
- Create specific locations where boats may/may not be anchored;
- Establish maintenance and usage restrictions for mooring areas;

- Enforce vessel speed limits through established no-wake zones and other such restrictions;
- Post lookouts on ferries to prevent mechanical impacts on sea grass beds and collisions with manatees and sea turtles;
- Prevent the improper disposal of trash during the construction and use of the docking facilities, paying particular attention to materials made of plastic and Styrofoam, buckets, tools, liquid materials (e.g., paints, solvents, and fuels), excess construction materials, hardware, and cigarette butts;
- Provide containers for proper garbage disposal and enforce the proper disposal of garbage;
- Ensure periodic disposal of trash by garbage disposal contractors; and
- Assist future property owners in establishing conservation easements to facilitate their receiving tax deductions and/or property tax exemptions.

4.10 Threatened and Endangered Species

Section 7 of the Endangered Species Act (ESA) of 1973 requires that the responsible federal agency proposing to undertake an action that has the potential to impact threatened and endangered species or their habitat to consult with the USFWS concerning the respective species or habitat. In accordance with the ESA (50 CFR 402.12), the Navy has developed a Biological Assessment (BA) to assess the potential impacts of the proposed action on listed species or their habitat. A meeting was held on October 31, 2005, to discuss the draft BA, which the Navy provided to the USFWS during the first part of October 2005. At this time, the document is under review and an informal Section 7 consultation is on-going. Through this process, the Navy will finalize the BA and will make a final determination of effects for each of the species and the designated critical habitat. Based on the establishment of 18 conservation parcels, the development of Special Zoning Plan, and the implementation of conservation measures, the Navy does not anticipate adverse effects to federally listed species and designated critical habitat. The final EA will summarize the results from the consultation process.

Implementation of the proposed action, the disposal of NAPR property to other federal agencies, Commonwealth, and civilian owners, would not in and of itself adversely affect any listed species. However, following completion of the proposed action, future land-use changes may affect listed species and designated critical habitat. To

minimize possible effects related to future activities, conservation measures for each of the species have been developed. By means of the special zoning plan, these measures would be provided to future landowners for their implementation. As part of the disposal process, special zoning (as discussed in Section 4.1) is been proposed to further minimize possible future effects. Future Commonwealth or private landowners/developers would be responsible for complying with the established special zoning. Private landowners/developers would be required to develop site and design plans for review, obtain construction permits, and apply to other regulatory processes to implement their respective development proposals. These permit processes would be subject to the specific requirements of the Special Zoning Plan, among other local and Federal environmental requirements. In addition, any changes in authorized uses for USACE-permitted facilities (e.g., marina, boat ramps, and cargo pier) would require a new permit from the USACE. Any Federal permit or activity that would result in possible adverse effects to threatened and endangered species will require a section 7 consultation between the Federal agency and the USFWS.

As mentioned in Section 4.1 and shown on Figure 4-1, the Navy has divided NAPR into 68 distinct parcels and the PRPB has been requested by the LRA to establish a Special Zoning Plan for NAPR property. From the 68 parcels, 18 parcels have been designated for conservation. These conservation areas support suitable habitat for threatened and endangered species. No future commercial or residential development projects would be allowed in conservation zones. Additionally, six parcels will be maintained in Federal ownership. These agencies are required to consult with the USFWS for activities that may affect species and their habitats. The remaining parcels have been identified for re-use or for sale. It is anticipated the PRPB will adopt the Special Zoning Plan to guide and control future development for the portion of NAPR that would not remain in Federal ownership. For each of the 68 distinct parcels, the Navy has developed, as necessary, conservation measures that future landowners should undertake for protection of threatened and endangered species or their habitat. A matrix indicating which parcels contain which listed species or habitat is provided in Table 4-3.

Table 4- 3. Presence or Absence of Suitable Habitat for Federally Listed Species by Parcel Number

Parcel Number	Listed Group or Species					Parcel Number	Listed Group or Species				
	BOA	ST	YSBB	M	P		BOA	ST	YSBB	M	P
1	✓		✓			35		✓	✓	✓	✓
2	✓		✓			36			✓		✓
3	✓		✓			37			✓		
4	✓		✓			38	✓	✓	✓	✓	✓
5	✓	✓	✓	✓	✓	39	✓	✓	✓	✓	✓
6	✓	✓	✓	✓	✓	40	✓		✓		
7	✓	✓	✓	✓	✓	41			✓		
8	✓	✓	✓			42		✓	✓	✓	✓
9	✓	✓	✓		✓	43	✓		✓		
10	✓	✓	✓			44	✓	✓	✓		✓
11	✓	✓	✓	✓	✓	45		✓	✓	✓	✓
12	✓	✓	✓			46		✓	✓	✓	✓
13	✓	✓	✓	✓	✓	47		✓	✓	✓	✓
14	✓		✓			48	✓		✓		
15			✓			49		✓	✓	✓	✓
16			✓			50			✓		
17			✓			51			✓		
18	✓		✓			52			✓	✓	✓
19	✓		✓			53			✓		
20	✓		✓			54			✓		
21			✓			55			✓		
22	✓		✓			56	✓	✓	✓	✓	✓
23			✓			57			✓	✓	✓
24			✓			58	✓	✓	✓	✓	✓
25		✓	✓	✓	✓	59	✓	✓	✓	✓	✓
26		✓	✓	✓	✓	60		✓	✓	✓	✓
27	✓		✓			61	✓	✓	✓	✓	✓
28	✓	✓			✓	62	✓	✓	✓	✓	
29	✓		✓			63	✓	✓	✓	✓	✓
30	✓		✓			64	✓	✓	✓	✓	✓
31	✓		✓			65	✓	✓	✓	✓	✓
32			✓			66	✓	✓	✓	✓	✓
33			✓			67	✓	✓	✓	✓	✓
34			✓			68	✓	✓	✓	✓	✓

Key:
✓ = Habitat present.
BOA = Puerto Rican boa and/or Virgin Islands tree boa (coastal habitats).
M = Manatee.
P = Pelican.
ST = Sea turtles (green, hawksbill, leatherback, and loggerhead).
YSBB = Yellow-shouldered blackbird.

The Navy has developed conservation measures that future property owners should implement. The Navy recommends full implementation of these measures to minimize possible adverse effects to threatened and endangered species and designated critical habitat. The Navy will notify the following future property owners, to include:

- Federal agencies. Conservation measures will be provided at or prior to the transfer of ownership responsibility;
- The Commonwealth of Puerto Rico. Conservation measures have been already provided to the Local Reuse Authority;
- Public sale. Conservation measures will be provided to each prospective bidder to be set out in the bid package for the respective parcel;
- Successful bidder. Transfer documents will make it clear that the grantee has the responsibility to implement conservation recommendations to meet ESA requirements;

The USFWS would be notified as to the successful bidder and provided a copy of the recommended conservation measures they were provided with the transfer documents. Furthermore, the LRA has requested that PRPB include the specific conservation measures as indicated in Tables 4-4, 4-5, 4-6, and 4-7 as part of the Special Zoning Plan.

The conservation of threatened and endangered species is required by Federal agencies under the ESA. Additionally the Commonwealth of Puerto Rico has a number of rules and regulations that private citizens, Federal and Commonwealth agencies have to adhere to prior to development. The implementation of the conservation measures is needed to minimize possible adverse effects to the species and designated critical habitat. During Section 7 consultation pursuant to the ESA, the USFWS based their determination for "not likely to adversely affect" on future landowners/developers implementing conservation measures included in the special zoning plan. To avoid violation of Section 9 of the ESA, private property owners who are unable to adhere to the conservation measures would be obligated to consult with the USFWS to seek an Incidental Take Permit under Section 10(a)(1)(B) of the ESA. To apply for this permit, the applicant is required to develop a Habitat Conservation Plan in coordination with the Caribbean Field Office. Failure to comply with the identified conservation measures may result in violation of Section 9 of the ESA. The USFWS has the authority to prosecute violations under the ESA.

In addition, Federal and Commonwealth agencies and private property owners would need to comply with the required reviews and/or permitting as necessary under other Federal and Commonwealth laws. All Puerto Rican entities must comply with relevant Federal laws (e.g., the Clean Water Act, the Clean Air Act and, to a lesser degree, the ESA) and the Commonwealth's planning, zoning, and environmental laws. Although all future potential impacts on species can not be fully anticipated and quantified, the Navy has determined that the establishment of 18 parcels for conservation, the establishment of the proposed Special Zoning Plan, the implementation of the proposed conservation measures, and the requirement of a Section 10(a)(1)(B) permit for applicants that cannot adhere to proposed conservation measures are effective measures to minimize possible adverse impacts to the species. The Navy has determined that the proposed action is not likely to adversely affect threatened and endangered species. The Navy has also determined that the proposed action will not adversely modify designated critical habitat for the yellow-shouldered blackbird.

4.10.1 Commonwealth-Listed Species

As discussed in Section 3.10, Commonwealth-listed species at NAPR include peregrine falcon (*Falco peregrinus*), least tern (*Sterna antillarum*), least grebe (*Tachybaptus dominicus*), West Indian whistling duck (*Dendrocygna arborea*), Caribbean coot (*Fulica caribea*), and snowy plover (*Charadrius alexandrinus*).

Peregrine falcon occurrence at NAPR is expected to be limited to transient individuals; therefore, redevelopment is not expected to result in impacts on this species. Freshwater and tidal wetland habitat for West Indian whistling duck, least grebe, Caribbean coot, snowy plover, and least tern is included in the proposed conservation area. No impacts on this habitat or on the use of the habitat by these species are expected as a result of the disposal/transfer of property at NAPR. However, redevelopment has the potential to result in increased human activity on the beaches at NAPR, which may result in impacts on nesting and feeding habitat for the snowy plover and least tern. Any proposed development at NAPR would require consultation with the DNER under Puerto Rico Law No. 241.

4.10.2 Federally Listed Species

Federally listed species at NAPR include yellow-shouldered blackbird (*Agelaius xanthomus*), brown pelican (*Pelecanus occidentalis occidentalis*), roseate tern (*Sterna dougalii dougalii*), piping plover (*Charadrius melodus*), hawksbill sea turtle (*Eretmochelys imbricata*), leatherback sea turtle (*Dermochelys coriacea*), green sea turtle (*Chelonia mydas*), Antillean manatee (*Trichechus manatus manatus*), Puerto Rican boa (*Epicrates inornatus*), Virgin Islands tree boa (*Epicrates monensis granti*) and cobana negra (*Stahlia monosperma*).

- **Yellow-Shouldered Blackbird**
  NAPR supports a very small (less than 20 individuals) population of the endangered yellow-shouldered blackbird (YSBB). All of the land area at NAPR is designated as critical habitat for the species. However, all of the land does not provide suitable habitat for the species, as some areas of NAPR have been developed. In 1980, the USFWS and the Navy establish an agreement for Section 7 consultations. In that occasion, a habitat map was developed based on the biological information available at that time for the species. During late 1990s, the Navy developed other maps, including feeding, roosting, and breeding habitats for the species. Based on that information, redevelopment based on the proposed Reuse Plan, may affect approximately 1811 acres of critical habitat at NAPR (Geo-Marine, Inc. September 2005). Approximately 6114 acres of habitat will be protected by the designation of conservation parcels and Special Zoning Plan.

  Redevelopment of these areas may result in loss or alteration of designated critical habitat for the YSBB. Individuals of this species could also be impacted by increased predation by introduced animals: increases in residential use have a potential to result in increased pet and feral animal populations that could prey on the yellow-shouldered blackbird. Additional impacts on eggs and nestlings could occur during construction and demolition activities. As discussed above, it is anticipated that the proposed conservation measures for protection of the YSBB as noted in Table 4-4 will become part of the Special Zoning Plan. Potential landowners or bidders will be informed of the presence of suitable habitat in each of the parcels and of the need to implement proposed conservation measures. Additionally, when developers apply for their respective permits they would become aware of the requirements for protection of the YSBB and their obligation for compliance with the ESA. Accordingly, implementing the proposed disposal action for NAPR and potential subsequent redevelopment of NAPR would not be likely to adversely affect the YSBB and its critical habitat.

Table 4-4. Conservation Measures for the Yellow-shouldered Blackbird

During planning and development phases; vegetation removal, land clearing activities, new construction; demolition or remodeling of existing structures; grounds maintenance; building maintenance; and general operations the following conservation measures should be implemented to minimize possible effects to yellow-shouldered blackbirds or their habitat:
▪ Protect as many existing on site palms and trees as possible in new development plans.
▪ If forested habitat is proposed for clearing or alteration, consultation with the USFWS should be initiated. *Note*: A minimum of one year maybe required to complete consultation.
▪ Schedule activity from September 1 through March 14 or conduct outdoor survey of building(s) (ledges, etc.) and nearby trees (within 50 meters of the building) for yellow-shouldered blackbird nests prior to start date if the development activity is scheduled to occur between March 15 and August 30. Surveys should be conducted by qualified and experienced personnel. Consult with the USFWS if a yellow-shouldered blackbird nest is found.
▪ Consult with the Puerto Rico DNER to identify the need for an endangered species permit to conduct such surveys.
▪ No trimming or cutting of palms and trees between March 15 and August 30 except in an emergency (i.e., downed trees and palms from storms).
▪ Survey for yellow-shouldered blackbird nests prior to any outdoor building maintenance activities between March 15 and August 30. Determine identity of any bird nest found. If a yellow-shouldered blackbird nest is found do not disturb, notify and consult with USFWS.
▪ Before moving parked outdoor equipment (e.g., carts, vehicles) check for yellow-shouldered blackbird nests (March 15 to August 30). If a yellow-shouldered blackbird nest is located do not disturb, notify USFWS.

Note: The above noted conservation measures are applicable to all the parcels as noted on Figure 4-1 except parcel 28. For those parcels that have been identified for conservation no commercial or residential development should take place; however, habitat management activities should be closely coordinated with USFWS.

Notice: If you are willing to comply with the general requirements and conservation measures listed above during the development and subsequent use of this parcel, you may proceed with the project. If you have any questions on the conservation measures, please consult with USFWS, Caribbean Field Office in Boquerón, Puerto Rico. Property owners that cannot adhere to the conservation measures should consult with USFWS to seek an Incidental Take Permit (ITP) under Section 10(a)(1)(B). Be aware that the preparation of a Habitat Conservation Plan is required to apply for an ITP. Failure to comply with the identified general requirements and conservation measures may result in the violation of Section 9 of the ESA. The USFWS has the authority to prosecute violations under ESA.

- **Puerto Rican Boa**

The Puerto Rican boa occurs in low densities at NAPR (Tolson 2004). Suitable habitat for the species has been identified at Punta Cascajo and in the hills near South Delicias, but adequate habitat exists in other forested areas throughout the base (Tolson 2004). Parcels identified for conservation may support habitat for the species. Impacts on forest areas through Phase II of the Reuse Plan would be minimized by focusing redevelopment in areas that were previously developed and in areas that are immediately adjacent to existing development. Of the approximately 900 acres of upland coastal forest at

NAPR, development through Phase II could impact up to 67 acres, or 7% of the upland coastal forest. No development is proposed for Punta Cascajo or the hills near South Delicias through Phase II, and minimal development is proposed in forested areas. Individual boas could be affected by demolition and construction activities. However, reported occurrences of this species at NAPR have been minimal. As discussed above, it is anticipated that the proposed conservation measures for protection of the Puerto Rican boa as noted in Table 4-5 would become part of the Special Zoning Plan. Potential landowners or bidders will be informed of the presence of suitable habitat in each of the parcels, and the need to implement proposed conservation measures. Additionally, when developers apply for their respective permits they would become aware of the requirements for protection of the Puerto Rican boa and their obligation for compliance with ESA.

Due to the low numbers of Puerto Rican boa reported in the area, the conservation of 18 parcels, the implementation of Special Zoning Plan, the limited amount of forested habitat to be affected by the proposed disposal action for NAPR and the potential subsequent redevelopment of NAPR through Phase II of the Reuse Plan, the Navy does not anticipate adversely effects to the Puerto Rican boa at NAPR.

Table 4-5. Conservation Measures for the Puerto Rican Boa

During planning and development phases ; vegetation removal, land clearing activities, new construction; demolition or remodeling of existing structures; grounds maintenance; building maintenance; and general operations the following conservation measures should be implemented to minimize possible effects to the Puerto Rican boa or its habitat:
▪ When planning new developments in areas that contain Puerto Rican boa habitat (see Table 4-3) strive to save as many existing trees as possible.
▪ If Puerto Rican boa habitat is present and proposed for clearing, consult with the USFWS. *Note:* A minimum of one year maybe required to complete consultation. As part of the consultation process, USFWS may require a survey just prior to clearing to determine the presence/absence of Puerto Rican boas. If Puerto Rican boas are presence contact the USFWS.
▪ Notify the USFWS if a Puerto Rican boa is found during maintenance activities, inside a building/structure or on the grounds.

Note: The above-noted conservation measures are applicable to parcels as noted on Figure 4-1, specifically parcels: 1, 2, 3, 4, 5, 6, 8,9,10,11,12,13,14 18, 19, 20, 22, 25, 27, 28, 29, 30, 31, 38, 39, 40, 43, 44, 48, 56,58, 59,60, 61,62,63,64,65,66,67, and 64.

Notice: If you are willing to comply with the general requirements and conservation measures listed above during the development and subsequent use of this parcel, you may proceed with the project. If you have any questions on the conservation measures, please consult with USFWS, Caribbean Field Office in Boquerón, Puerto Rico. Property owners that cannot adhere to the conservation measures should consult with USFWS to seek an Incidental Take Permit (ITP) under Section 10(a)(1)(B). Be aware that the preparation of a Habitat Conservation Plan is required to apply for an ITP. Failure to comply with the identified general requirements and conservation measures may result in the violation of Section 9 of the ESA. The USFWS has the authority to prosecute violations under ESA.

- **Virgin Islands Tree Boa**

  The existence of the Virgin Islands tree boa at NAPR has not been confirmed. The Virgin Islands tree boa was not found during recent surveys and no occurrence of this species has been reported at NAPR. However suitable habitat for the species has been identified at the Punta Puerca and Puerto Medio Mundo coastlines. As discussed above, it is anticipated that the recommended conservation measures for protection of the Virgin Island tree boa as noted in Table 4-6 will become part of the Special Zoning Plan. No development through Phase II for these areas is proposed by the Reuse Plan. Potential landowners or bidders will be informed of the presence of suitable habitat in each of the parcels, and the need to implement proposed conservation measures. Additionally, when developers apply for their respective permits they would become aware of the requirements for protection of the Virgin Islands tree boa and their obligation for compliance with ESA. Therefore, implementing the proposed disposal action for NAPR and potential subsequent redevelopment of NAPR through Phase II of the Reuse Plan would not adversely affect the Virgin Islands tree boa.

Table 4-6. Conservation Measures for the Virgin Islands Tree Boa

During planning and development phases; vegetation removal, land clearing activities, new construction; demolition or remodeling of existing structures; grounds maintenance; building maintenance; and general operations the following conservation measures should be implemented to minimize possible effects to the Virgin Islands tree boa or its habitat:
▪ When planning new developments in areas that contain Virgin Islands tree boa habitat (see Table 4-3) strive to save as many existing trees as possible.
▪ If Virgin Islands tree boa habitat is present and proposed for clearing, consult with USFWS. Note: A minimum of one year maybe required to complete consultation. As part of the consultation process, USFWS may require a survey just prior to clearing to determine the presence/absence of Virgin Islands tree boas. If Virgin Islands tree boas are presence contact USFWS.
▪ Notify the USFWS if a Virgin Islands tree boa is found during maintenance activities, inside a building/structure or on the grounds.

Note: The above-noted conservation measures are applicable to parcels as noted on Figure 4-1, specifically parcels: 1, 2, 3, 4, 5, 6, 8,9,10,11,12,13,14 18, 19, 20, 22, 25, 27, 28, 29, 30, 31, 38, 39, 40, 43, 44, 48, 56,58, 59,60, 61,62,63,64,65,66,67, and 64.

Notice: If you are willing to comply with the general requirements and conservation measures listed above during the development and subsequent use of this parcel, you may proceed with the project. If you have any questions on the conservation measures, please consult with the USFWS, Caribbean Field Office in Boquerón, Puerto Rico. Property owners that cannot adhere to the conservation measures must consult with USFWS to seek an Incidental Take Permit (ITP) under Section 10(a)(1)(B). Be aware that the preparation of a Habitat Conservation Plan is required to apply for an ITP. Failure to comply with the identified general requirements and conservation measures may result in the violation of Section 9 of the ESA. The USFWS has the authority to prosecute violations under the ESA.

- **Brown Pelican**

  The transfer of NAPR lands to civilian ownership may result in increased public access to brown pelican near-shore and on-shore roosting areas. Potential impacts on brown pelicans may include increased harassment, injury, and

mortality, as well as the loss of near-shore and on-shore roosting habitats due to increases in recreational activities (e.g., swimming, fishing, boating) and vehicular traffic on or near beach areas (e.g., four wheelers, dirt bikes, trucks). Additional impacts on the species may involve ingestion of plastics or other waste items that are produced as a result of redevelopment initiatives (Geo-Marine, Inc. September 2005). Construction of marine facilities will require a permit from USACE. This federal permit process would require a Section 7 consultation between the USACE and the USFWS. During Section 7 consultation, possible adverse effects would be identified and minimized by site-specific conservation measures. However, the Navy believes that the establishment and management of 13 coastal conservation parcels may reduce possible effects to brown pelicans. Additionally brown pelicans occur in low numbers at NAPR and do not use the property for nesting. The Navy has determined that redevelopment is not likely to adversely affect this species.

- **Piping Plover**
  The occurrence of piping plover at NAPR is expected to be limited to vagrants; a vagrant species occurs less than once every 10 years (Geo-Marine, Inc. September 2005). Therefore, redevelopment at NAPR is not likely to adversely affect the piping plover.

- **Roseate Tern**
  The occurrence of roseate tern at NAPR is expected to be limited to accidental because the species could be pushed into nearby coastal waters or inshore during intense storms, but is otherwise not expected to be present at NAPR (Geo-Marine, Inc. September 2005). Therefore, redevelopment at NAPR is not likely to adversely affect the roseate tern.

- **Cobana Negra**
  Coastal development and loss of wetland habitat have been identified as the biggest threats to cobana negra populations in Puerto Rico (Geo-Marine, Inc. September 2005). A single individual of this species was found in a coastal scrub forest area west of American Circle, in an area classified as undevelopable due to slopes in excess of 15%. This is an area identified as a conservation parcel. Cobana negra is most likely to be found in salt flats and mangrove edges in brackish, seasonally flooded wetlands. These areas are included in the conservation area in Zone 9. No development in the vicinity of the identified cobana negra individual or in appropriate habitat for cobana negra is proposed through Phase II. The cobana negra is extremely rare in the proposed action area. The only known individual is located in an area that will be conserved, and additional suitable habitat for this species is within the proposed conservation zone. Accordingly, implementing the proposed disposal action for NAPR and potential subsequent redevelopment of NAPR is not likely to adversely affect cobana negra.

- **Sea Turtles**
  Disposal and reuse of NAPR under the preferred alternative would not directly affect sea turtles. However, indirect impacts on sea turtles could result from

increases in boat traffic (and hence sea turtle/boat collisions); increases in entanglement in discarded fishing gear or ingestion of harmful refuse, or interference of these materials with successful nesting; an increase in nest predation (or disturbance) due to potential increases in nest predators (or human disturbance); an increase in illegal hunting; degradation of habitat from water quality degradation or physical damage from boats; and lighting that distracts nesting or hatchling sea turtles. Each of these potential impacts is discussed below.

- **Sea Turtle/Boat Collisions**
  A direct consequence of property disposal would be the increase in private and commercial vessel traffic. Since most of the waters surrounding NAPR support habitats that are used by sea turtles for feeding and resting, e.g., sea grass beds and coral reefs (see Figure 3-9), the potential for sea turtle/boat collisions would be greater than that which currently exists.

  As discussed in Section 3.10, about one-quarter of the sea turtles recorded in NSRR waters by Rathbun *et al.* (1985) were in Enseñada Honda, particularly the eastern half. While the marina would remain the same size under the proposed reuse, the actual use of the marina and ferry may increase due to the transitioning of the property from military to public use. However, the current permits for the marine facilities are construction/use permits. Therefore, any changes in operational tempo for USACE-permitted facilities (e.g., marina, boat ramps, and cargo pier) would require a new permit from the USACE. Any increase in vessel traffic in Enseñada Honda which could result in a corresponding increase in the potential for sea turtle/boat collisions in this area would be regulated through the USACE permitting process. It is anticipated that prior to issuing a new permit, the USACE would consult with NOAA Fisheries to evaluate possible effects of the proposed actions and to implement conservation measures to minimize possible adverse effects pursuant to Section 7 of the ESA. For this reason, although possible adverse effects are anticipated future section 7 consultation between the USACE and NOAA Fisheries will address these possible effects. The Navy will not be included in the future development of NAPR consultation for any activity with future federal nexus.

- **Entanglement in and Ingestion of Fishing Gear and Other Debris**
  As an additional consequence of the property disposal, sea turtles would potentially be at increased risk of entanglement in or ingestion of abandoned fishing gear (such as abandoned monofilament fishing line) or other refuse (National Research Council 1990). Diaz (2000) noted that during operation of NSRR a seasonal accumulation of trash occurred at beach #1 (along the northeast coast of NAPR), and Geo-Marine, Inc. (September 2005) noted that piles of discarded fishing gear were found along some NAPR shorelines. In Puerto Rico, beaches are managed by the DNER. This agency regulates both, the protection of sea turtles and fishing activi-

ties. The Navy anticipates that the DNER will effectively manage both activities, avoiding possible effects on sea turtles.

- **Nest Predation and Hunting**
  During nest monitoring at NSRR/NAPR in 2002 and 2004, Geo-Marine, Inc. (September 2005) recorded a substantial number of nests that had been uncovered and preyed upon. In 2002, 35 of the 73 nests were depredated. In 2004, fewer surveys were conducted; in this year, four of 16 nests experienced depredation. Potential sea turtle nest predators include mongoose, feral cats and dogs, rats, and iguanas (Geo-Marine, Inc. January 2005; Belardo *et al.* 1997). Reuse of the property may lead to an increase in the number of these potential predators (e.g., dogs and cats), or an increase in their occurrence in the less developed or undeveloped areas (where sea turtle nesting potentially occurs). Such a potential increase in predators, and hence predation of sea turtle nests, could adversely affect successful sea turtle nesting on the property if it occurred year after year. However, the beaches will be managed by the DNER, and the Navy anticipates the DNER will effectively managed these issues.

  As mentioned in Section 3.10, in addition to the potential animal predators mentioned above, humans have been noted to illegally hunt sea turtles and eggs (Belardo *et al.* 1997; National Marine Fisheries Service and U.S. Fish and Wildlife Service 1993). Poaching of eggs and hunting of sea turtle are regulated by federal and local agencies. The Navy anticipates the appropriate agencies will effectively manage these issues.

- **Degradation of Habitat**
  Impacts on sensitive habitats supporting sea turtles (i.e., sea grass beds and coral reefs) could occur from boats anchoring or grounding or from propeller scouring and from degradation of water quality from runoff and fuel spills. Adverse impacts associated with water quality degradation would be avoided by compliance with applicable Commonwealth and federal laws, which mandate the use of standard measures (e.g., silt fencing, hay bales, earth swales to channel runoff) during construction and operation to control upland erosion and/or storm water runoff from the development sites into adjacent waters. Based on the implementation of the comprehensive sea turtle conservation measures listed in Table 4-7, implementing the disposal action is not likely to adversely affect sea turtles and their habitat.

- **Lighting Impacts**
  Light pollution on nesting beaches can adversely affect sea turtles because it can alter sea turtle behavior at night (Witherington and Martin 1996). Artificial light sources can deter nesting sea turtles from emerging onto a beach, thereby forcing the turtle to select a less suitable nesting site, and can disorient sea turtles returning to the ocean. Hatchlings emerge from the nest at sundown and use the diminishing light on the horizon as a cue for the direction of the ocean. Artificial lights can misorient (i.e., cause to

move in the wrong direction) and disorient hatchlings, thereby increasing the time it takes them to reach the water (Witherington and Martin 1996). Sea turtles' ability to survive without water is limited, so prolonged exposure increases the chance of mortality from dehydration, predators, and fatigue, especially for hatchlings. The proposed conservation measures for protection of the sea turtles included in Table 4-7 include the development of a comprehensive conservation plan to address possible adverse effects of lighting on sea turtles. This measure will become part of the Special Zoning Plan. Therefore, when developers apply for their respective permits they would become aware of the requirements for protection of the sea turtles and their obligation for compliance with ESA. Implementing the disposal action would not directly result in any impacts to sea turtles due to lighting. With developers following existing Commonwealth laws and regulation and following the lighting requirements which will be part of the Special Zoning Plan, subsequent redevelopment is not likely to adversely affect sea turtles.

Table 4-7. Conservation Recommendations for Sea Turtles

During planning and development phases ; vegetation removal, land clearing activities, new construction; demolition or remodeling of existing structures; grounds maintenance; building maintenance; and general operations the following conservation measures should be implemented to minimize possible effects to the sea turtle species and their habitat:
▪ Avoid the removal of vegetation, fence installation, construction activities, and light installation within 50 meters from the high tide.
▪ Designate a buffer zone of additional 20 meters to minimize indirect impacts from the project and plant sea grapes and native trees within the zone.
▪ Prepare and implement a comprehensive lighting plan to avoid detrimental impacts of artificial lighting on sea turtles. The goal of the plan should be that lights not be seen directly, indirectly or cumulatively from the beach. Light management strategies such as shielding, lowering of the lights, locating the lights away from sight view of the beach, using an alternate light source such as Low Pressure Sodium Vapor, and planting of vegetation barriers are some of the available alternatives to reach the plan goal. In already constructed projects, all lights visible from the beach should be eliminated or relocated so as not to be visible. Those remaining lights shall be modified in order to avoid or minimize the possibility of disorientation. The plan goal and the light management strategies should be specified, described and located in the lighting plan. The plan should be submitted to the DNER and the USFWS for review and approval.
▪ Once the plan is fully implemented, a lighting inspection should be conducted to identify and correct any remaining problematic lights.
▪ Enhance coastal vegetation with planting of native species (e.g., sea grapes) within the maritime zone. Protect coastal vegetation and nesting habitat from vehicular traffic in the area.
▪ Consult with the USFWS and Puerto Rico DNER on all beach use plans and permit requirements

Table 4-7. Conservation Recommendations for Sea Turtles

During planning and development phases ; vegetation removal, land clearing activities, new construction; demolition or remodeling of existing structures; grounds maintenance; building maintenance; and general operations the following conservation measures should be implemented to minimize possible effects to the sea turtle species and their habitat:
▪ Notify the DNER if you observe an injured or dead turtle anywhere on the property.
▪ Pesticide and herbicide applications must follow Commonwealth of Puerto Rico regulations.

Note: The above conservation measures are applicable to the parcels as noted in Table 4-3; specifically these are parcels: 5, 6, 7, 8, 9, 10, 11, 12, 13, 25, 26, 28, 35, 38, 39, 42, 44, 45, 46, 47, 49, 56, 58, 59, 60, 61,62,63, 64, 65, 66, 67, and 68.

Notice: If you are willing to comply with the general requirements and conservation measures listed above during the development and subsequent use of this parcel, you may proceed with the project. If you have any questions on the conservation measures, please consult with the USFWS, Caribbean Field Office in Boquerón, Puerto Rico. Property owners that cannot adhere to the conservation measures must consult with the USFWS to seek an Incidental Take Permit (ITP) under Section 10(a)(1)(B). Be aware that the preparation of a Habitat Conservation Plan is required to apply for an ITP. Failure to comply with the identified general requirements and conservation measures may result in the violation of Section 9 of the ESA. The USFWS has the authority to prosecute violations under ESA.

Sea turtles would not be directly impacted by the disposal of NAPR. Subsequent redevelopment could adversely impact sea turtles from follow-on actions both on land and in the waters surrounding NAPR. The transfer of beachfront property at NAPR from federal to civilian ownership could lead to disruption of normal nesting and hatchling emergence behaviors, degradation and/or loss of sea turtle nesting and foraging habitat, increased susceptibility to human and animal predation and increased interaction with fishing gear and watercraft. However, as noted above, the implementation of sea turtle conservation measures as provided in the Special Zoning Plan will minimize possible adverse effects to the species. Additionally, marine facilities with the potential to increase effects related to vessel traffic would require a USACE permit and a Section 7 consultation with the USFWS. Therefore, the Navy has determined that implementing the proposed action is not likely to adversely affect sea turtles at NAPR.

■ **West Indian Manatee**

Disposal and reuse of NAPR under the preferred alternative would not directly affect manatees. However, indirect impacts on manatees could result from increases in boat traffic (and hence manatee/boat collisions); degradation of habitat; and entanglement in abandoned or active fishing gear. Each of these potential impacts is discussed below.

- **Manatee/boat collisions**

  As discussed in Section 3.10, collisions with watercraft are one of the greatest sources of manatee deaths in Florida, while gill nets represent the greatest threat in Puerto Rico. An indirect consequence of property dis-

posal would be the potential for increase in private and commercial vessel traffic. Most of the waters surrounding NAPR support habitat that is used by manatees for feeding and resting. Instituting boating restriction such as speeds and anchoring locations as may be required as part of new Federal permits would reduce the potential for manatee/boat collisions.

As discussed in Section 3.10, manatees use Enseñada Honda for feeding, traveling, and socializing. USFWS data have recorded manatees as feeding in areas on the southeastern end of Enseñada Honda, the southwestern end, and the middle-western area. Any increase in vessel traffic in Enseñada Honda could result in a corresponding increase in the potential for manatee/boat collisions in this area. While the marina would remain the same size under the proposed reuse, the actual use of the marina and ferry may increase when the property transitions from military to public use and when the restricted waters designation around NAPR is lifted. In the event any changes in authorized uses for USACE permitted facilities (e.g., marina, boat ramps, and cargo pier) took place, it would require a new permit from the USACE and a section 7 consultation with the USFWS.

Another indirect consequence of the property transfer would be loss of protection of certain waters around NAPR. Manatees heavily use pelican Cove, in the Capehart area. Under the Navy's use of the property, no boats (other than harbor police boats) were allowed in Pelican Cove unless coordinated with and approved by the Public Works Department, (Martinez 2004). Removal of this protection would increase the risk of disturbance or harm to manatees from boat collisions in this area.

- **Degradation of habitat**
  As shown on Figure 3-9, sea grass beds occur in most areas adjacent to NAPR. Sea grass beds are extensively used by manatees as feeding and resting areas. Potential impacts on sea grass could result from anchoring, boat groundings, or propeller scouring associated with increased boating activity in the waters surrounding NAPR. In the event any changes in authorized uses for USACE permitted facilities (e.g., marina, boat ramps, and cargo pier) took place, it would require a new permit from the USACE and a section 7 consultation with the USFWS. Instituting boating restriction such as speeds and anchoring locations as maybe required as part of new permit requirements could lessen this potential for habitat degradation.

- **Entanglement in abandoned or active fishing gear**
  Rathbun and Possardt (1986) reported that entanglement in gill nets is a potential source of manatee deaths in Puerto Rico. An indirect impact of the disposal of NAPR could be increased fishing around NAPR. This could increase the likelihood of broken/abandoned gill nets. As stated previously, manatees travel all the waters in the southeastern area of Puerto Rico. While the waters around NAPR have been restricted to boats, fishing just out side the restricted areas did take place. Thus, the

potential for broken/abandoned gill nets from fishermen impacting manatees has always existed adjacent to NAPR. The exception would be Enseñada Honda. However, pleasure boats and commercial vessels most likely would use Enseñada Honda. This could potentially limit the usage of gill nets and thus limit the likelihood for impacts to manatees.

In summary, threatened and endangered species and habitat could potentially be indirectly affected by the reuse of NAPR. As required by Section 7 of ESA, the Navy has initiated consultation with the USFWS regarding the significance of any potential impacts to protected species as a result of disposal and reuse of NAPR. Because of the speculative nature of the Reuse Plan, its full effects on listed species cannot be addressed. However, with the establishment of 18 parcels for conservation and the adoption of a Special Zoning Plan for NAPR that incorporates the implementation of proposed conservation measures into the site/development review process, as previously described and the requirement to obtain new permits from the USACE for any changes in authorized use for permitted facilities, the Navy has determined that the implementation of the Reuse Plan at NAPR is not likely to adversely affect threatened and endangered species or designated critical habitat at NAPR.

4.11 Socioeconomics

4.11.1 Population and Housing

Population

The redevelopment of NAPR is expected to stimulate the local economy and provide growth for the region. People will move to the area and, because of the new construction of 800 dwelling units and potential use of 150 recently built apartments between the Bundy, Capehart, and downtown areas, the infrastructure would be in place to accommodate this population increase. Under the assumption that three individuals reside in each dwelling unit, the permanent residential population of the local area could increase by 2,850 people during Phase I and II (a one- to ten-year time frame). This estimate would not include temporary employees or patrons staying in local temporary or vacation units (i.e., 400 guest rooms proposed in the Bundy area). The increase of 2,850 individuals over the course of ten years would represent an increase of approximately 7% over the 2000 U.S. Census population of Naguabo and Ceiba. However, this number is

slightly deceiving because the 2000 population includes a fully occupied base of approximately 7,300 in 2001 (U.S. Army Corps of Engineers 1998).

There is also the potential for an influx of people to the Fajardo/Ceiba Region because of proposed job creation. The actual number of jobs that will be filled locally compared with people from outside the area who would move closer if hired is speculative and cannot be quantified with reasonable certainty.

Housing

The proposed construction of 800 dwelling units and use of 150 apartments, in addition to 400 guest rooms, will allow a gradual increase in the population over the course of 10 years as construction is completed. In addition, it is anticipated that the vacancy rate in the region (16%) will improve slightly due to the jobs created by the development of NAPR and people moving into the region. A portion of these individuals would live in the newly constructed developments and others would live in the existing community. It has been reported that several new residential developments in the region have experienced high levels of absorption recently, and it is believed that similar results will be noticed with residential development at NAPR.

4.11.2 Economy, Employment, and Income

Economy

Much of the development proposed in the Reuse Plan is meant to stimulate the economy of the Commonwealth and local municipalities with opportunities to bring businesses to the area from outside Puerto Rico or the immediate Fajardo/Ceiba Region. Some development scenarios meant to accomplish this are the reuse of the airport and the addition of a government/training center, a golf course, a university campus, marina, ferry terminal, beaches/open space, science park, and conservation areas. These features would draw individuals and businesses from more distant locations to eastern Puerto Rico.

A major benefit of any type of development that takes place at NAPR would be the construction spending that would take place through redevelopment. Although this would be a short-term beneficial impact, it has the potential to be significant if local labor and materials are used to the extent practicable.

The money spent during both construction phases and operational phases would have an initial direct economic impact on the community. This money would be cycled through the local economy through subsequent business spending and wages earned locally, creating further indirect and induced economic benefits — the multiplier effect. This would continue until "leakages" (i.e., money going to businesses or wages earned by employees who are from outside the local community) slowly reduce the amount of the initial expenditure.

The economic sectors that would experience the greatest effect as a result of the disposal and redevelopment of NAPR would include the tourism, marina/port, industrial, and retail sectors. The main economic impacts expected for each of these sectors are discussed below.

- **Tourism**
  As discussed in Section 3.11, tourism is an important sector of the eastern Puerto Rican economy and, as such, much of the development will be tourism-related. The reuse of the airport will serve to enhance the tourism sector locally. The airport will offer commercial passenger flights, general aviation, and cargo transport. The passenger transport capabilities will reduce the time and increase the ease with which tourists can reach destinations in eastern Puerto Rico. Other amenities proposed are the expansion of the current golf course to 18 holes, reuse of the marina boat slips, reuse of the ferry terminal, and preserving open space, beach, and conservation areas.

  Given a setting in eastern Puerto Rico that is already rich with tourism and attractions such as El Yunque, it is expected that there will be sufficient traffic and patrons from outside the immediate area to use these new developments. There will be a net positive economic impact with respect to tourism, although quantifying the actual impact or number of visitors would be too speculative based on available data.

- **Marina/Port**
  The marina/port area of NAPR would continue to be used for similar activities. The 72 existing wet slips (Section 3.11.2) would be reused to attract private and commercial boats. A ferry terminal would be established and, operated by the Port Authority, would be used for both passenger and light cargo transport. Attracting patrons to the property and offering multiple modes of transportation to reach their destination is important for the property's development. The new facilities in the marina/port area would have a positive economic impact through fees charged for boat slips, ferry transport, and light cargo rates, and by allowing access to the region, where money would be spent on other amenities.

- **Industrial**
  A variety of industrial development is proposed, including cargo shipping at the airport and port, a government/training center, a university campus, the fuel tank farm, and a science park. A significant amount of money would be spent in the short-term to erect these facilities, which would then stimulate growth, employment, and spending in the local economy and result in an overall positive economic impact on the local economy. The current inventory of industrial space in the Ceiba/Naguabo Region is approximately 450,000 square feet of PRIDCO industrial buildings, with an 18% vacancy rate. The success of the proposed industrial space would be in attracting new business associated with shipping/receiving at the airport and attracting tenants of older PRIDCO facilities to newly constructed industrial buildings that better suit the tenant's business needs. If this is done successfully, it will create a positive economic benefit for the local community.

- **Retail**
  There will be limited direct impacts related to increased retail establishments and corresponding sales associated with the development of NAPR. However, the local municipalities and adjacent shopping areas may experience an increase in spending due to an expected increase in tourist traffic and, potentially, in local residents living in homes developed on the site.

Employment

The development of NAPR offers a variety of employment opportunities and will serve to stimulate the local economy by supplying construction spending and employment in short-term and full-time jobs in a variety of sectors once the airport, shipping/receiving, and other facilities are operational. As discussed in Section 3.11.2, local municipalities are moderately depressed (unemployment rates between 7% and 10%), and new industry and job opportunities will enhance the employment market, both in the short- and long-term. Based upon assumptions made and employment-to-square footage calculations from the Reuse Plan, it is estimated that approximately 5,000 jobs, including jobs in the community service and tourism sectors, will be created in Phase I and II of the development process.

Based upon the population projections (increase of 2,850) under Phase I and II of the Reuse Plan, it is anticipated that an additional 12 police officers (4.1/1,000 residents x 2,850 new residents) in the local community would be needed to maintain a similar proportion of residents to public safety officers before and after the proposed action.

Based upon the population projections (increase of 2,850) and the additional structures proposed at NAPR under Phase I and II of the Reuse Plan, it is anticipated that

additional fire-fighting resources would be required. In order to maintain the existing proportion of firefighters to residents an additional one or two firefighters would be necessary.

The Reuse Plan proposes that the hospital be reused as part of the development of NAPR. The specific capabilities and services to be offered are yet to be determined. However, it is expected that they would be sufficient to address immediate, emergency situations occurring locally. There may be an increased need for family practice physicians to accommodate potential population increases, but at the rate at which residential homes will be built, there should be adequate time for the needed medical resources to move into the area if the current inventory is insufficient.

It is proposed that the former elementary school in the downtown area be reused as a middle/high school and that the former middle/high school in the Capehart area be reused as a private bi-lingual school as part of the development of NAPR. Additionally, a university campus has been proposed for the downtown area that will accommodate people seeking advanced education and research experience. These facilities would serve to enhance the level of education available in the region.

This property was one of the largest contiguous parcels of land left in Puerto Rico. The U.S. Navy's development of the parcel has been kept in check and many areas can be considered pristine. To take advantage of this, the reuse of NAPR seeks to maintain many areas of the property for open space, conservation, and recreational and beach activities, which would attract tourists in the area to the property to enjoy the natural setting.

In addition, the Reuse Plan proposes the upgrade of the current 9-hole golf course to an 18-hole course with improved drainage. This would increase the influx of tourists and money to the local economy and is viewed as a positive economic benefit.

Income

The transfer of NAPR would have a positive impact on taxes and revenues generated on the island. The result of the transfer would be the removal of approximately 8,442 acres of land from tax-exempt status to taxable status. In addition, the municipality of Ceiba has instituted a construction tax on future development on NAPR, which will generate even more income. Furthermore, the increased tourism and business activity

associated with economic-related development also would have a positive impact on the tax base by increasing the value and amount of improved property in the municipalities.

4.12 Cultural Resources

In accordance with Section 106 of the National Historic Preservation Act (NHPA), the Navy entered into consultation with the Puerto Rico SHPO (see May 10, 2005 letter in Appendix A). The protection of historic and archaeological resources at NAPR will be finalized through the Section 106 process.

The majority of the eligible archaeological sites fall within areas designated for conservation. The conservation areas generally include coastal mangroves, wetlands, and an associated buffer zone consisting of upland forest areas. The Navy proposed to transfer lands containing all but four of the archaeological sites to the Commonwealth of Puerto Rico. Most of the area containing archaeological sites would be designated as conservation. However, any site not in a conservation zone would also be afforded protection as it would be on Commonwealth property and prior to any development Commonwealth laws regarding the protection of archaeological resources would be followed. For those four sites not being transferred to the Commonwealth of Puerto Rico, the Navy proposes to undertake data recovery. Data recovery would be undertaken in coordination with the Puerto Rico SHPO and in accordance with the Secretary of Interior's standards for data recovery.

For those structures located on NAPR that are deemed eligible for listing on the NRHP, the Navy will undertake recordation to mitigate the potential for adverse effect in the event any structures are demolished or modified subsequent to Navy ownership. Recordation would be undertaken in accordance with applicable National Parks Service standards and as agreed to between the Navy and the Puerto Rico SHPO.

Prior to implementing the Proposed Action, a Memorandum of Agreement (MOA) between the Navy, the Puerto Rico SHPO, and the Advisory Council on Historic Preservation would be executed. The MOA would detail which archaeological sites would undergo data recover and to what level. In addition, it would specify the level of documentation needed for respective historic structures or the consultation process needed to establish the level of recordation. Through the execution of a MOA, and by

implementing the stipulations of the MOA, the Navy will meet their requirements under Section 106 of the NHPA.

4.13 Coastal Zone Management

The Navy has determined that the proposed action of disposal of NAPR to non-federal entities as described in Section 1.5 would not constitute an effect on coastal uses and resources, as defined by enforceable policies of the Puerto Rico CZMP. Accordingly, the Navy will provide the PRPB with a copy of the negative determination. The future reuse of the disposed NAPR property would be under the purview of the PRPB, which would be responsible for ensuring that development projects and activities do not adversely affect the existing sensitive ecosystems within the coastal zone.

Once the areas of NAPR are transferred from federal ownership, however, these 8,435 acres of land would no longer be excluded from the coastal zone, and proposed actions within this area with the potential to impact the coastal zone would be subject to CZMP-consistency reviews.

4.14 Environmental Justice / Protection of Children from Environmental Health Risks

In accordance with Executive Order 12898, dated February 11, 1994, and Secretary of the Navy Notice 5090, dated May 27, 1994, the Navy is required to identify and address, as appropriate, the potential for disproportionately high and adverse human health or environmental effects of its actions on minority or low-income populations.

The Navy has not directly or indirectly used criteria, methods, or practices that discriminate on the basis of race, color, or national origin. In addition, the Navy has analyzed the economic and social impacts of the proposed action (i.e., disposal of NAPR) and subsequent reuse and determined that no economic or social impacts on minority or low-income communities are anticipated. Because of the nature of disposal and reuse, and the oversight of the planning process by the LRA, most impacts would be expected to be positive for the local communities. According to the Reuse Plan, guiding principles of the Commonwealth during planning for reuse aimed to benefit the citizens, including the residents of Ceiba, Naguabo, and surrounding areas. These guiding principles were to encourage community participation, promote activities to create jobs, and to protect natu-

ral resources. According to the Reuse Plan, at full build-out the total number of jobs created would be an estimated 18,200 to 19,700. Some portion of the jobs created would likely go to residents in the nearby communities. There would also likely be some positive economic benefits for the business sector in these communities from the additional spending by tourists and visitors and new residents and employees, in addition to the construction dollars that would be introduced to the economy. Additionally, no human health impacts are anticipated. No mitigation measures are necessary to address significant adverse environmental impacts on minority and low-income communities. Therefore, the proposed action does not result in disproportionately high and adverse human or environmental effects on minorities or low-income populations.

Executive Order No. 13045, "Protection of Children from Environmental Health Risks," mandates federal agencies to identify and assess environmental health and safety risks that may affect children disproportionately as a result of the implementation of federal policies, programs, activities, and standards (63 Federal Register 19883 to 19888). The preferred alternative would not negatively impact schools, housing areas, or gathering places of children. Therefore, there would be no short- or long-term environmental health or safety risks to children posed by the implementation of the preferred alternative.

4.15 Irreversible and Irretrievable Commitment of Resources

The proposed action is the disposal of NAPR. Implementation of the proposed action would not result in the irreversible or irretrievable loss of any resources discussed in this EA. The proposed action does not irreversibly or irretrievably curtail the reasonable range of potential uses of the environment. However, because of the speculative nature of the Reuse Plan, its full effects on all resources cannot be addressed. Under existing laws and regulations, future landowners/developers would be responsible for establishing zoning and applying for building permits and other approvals to implement their respective development projects. The engineering and design studies needed to obtain the various approvals from the respective regulatory agencies have not been accomplished.